Wabash Diesel 'Spot' System

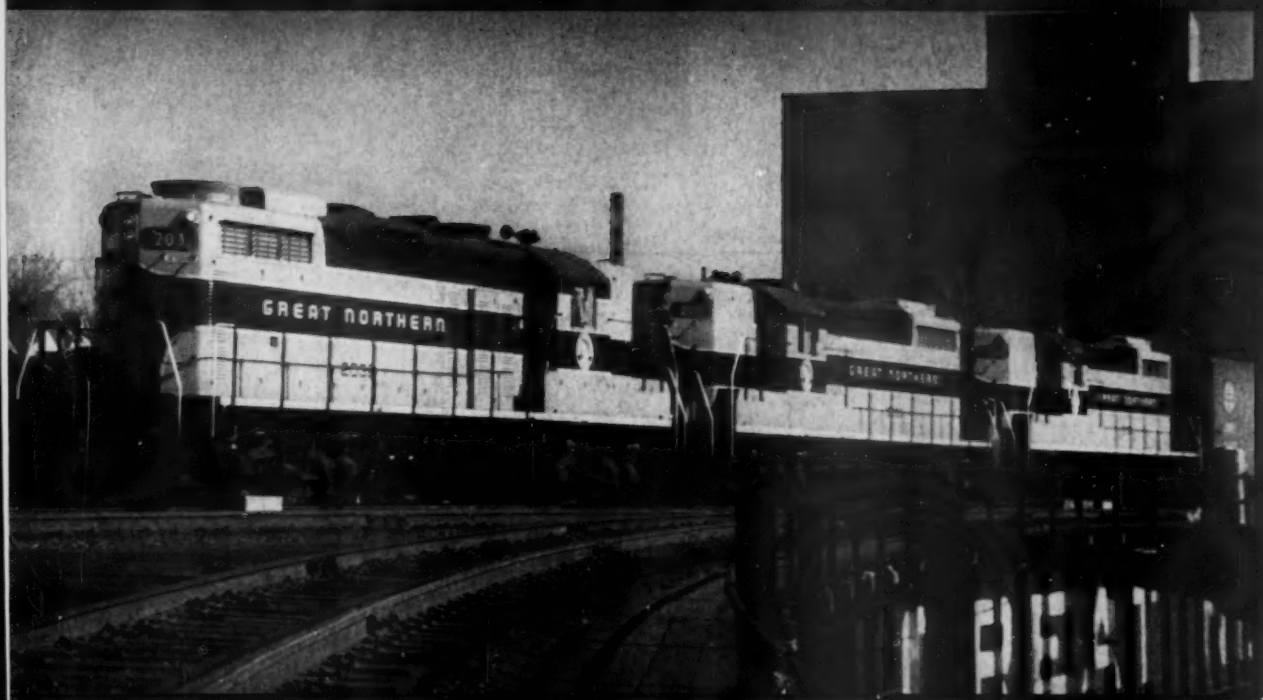
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RAILWAY

LOCOMOTIVES AND CARS

A SIMMONS BOARDMAN TIME-SAVER PUBLICATION

DECEMBER 1961





GN Tests Slip-Suppressing Brake

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L&N Getting Aluminum Covered Hoppers

. . . page 33


Merry Christmas
W. H. MINER, INC. CHICAGO

THEY PLANNED ON YELLOW STRAND TO HOLD DOWN COSTS

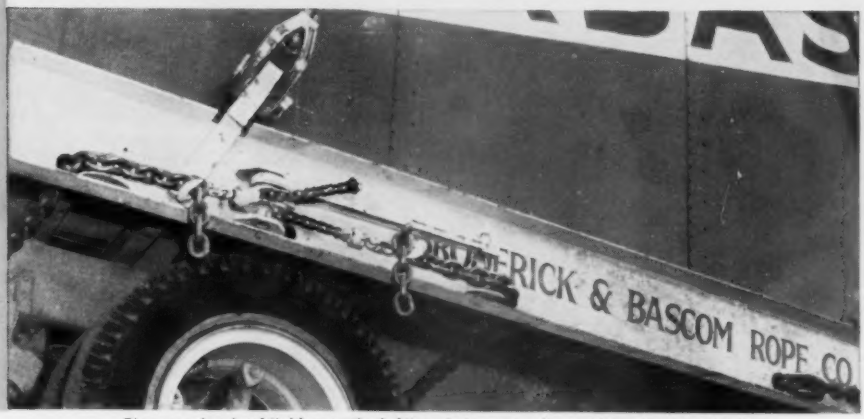
on piggy-back loading operation



Type M1-TT Sling



Lifting rig uses four type M1-BT Yellow Strand Braided Safety Slings, 8 parts of ½" rope, and twin thimbles, allowing rope to run completely around thimble.



Close-up showing hitching method. Alloy chain snubs channel-iron side rails tightly. Yellow Strand patented twin thimbles secure sling bridles to beam.

Yellow Strand Sling Experts and Wabash R.R. Develop Unique Low-Cost Piggy-Back Lift

One of the many advantages you get with Yellow Strand is service. Yellow Strand experts helped develop this economical lifting rig taking advantage of equipment already in use for other purposes. The assembly is versatile, quickly and easily applied, and handles different trailers with minimum adjustment. The strong, durable Yellow Strand Braided Slings will lift forty tons. What's your sling problem? Call your Yellow Strand representative anytime for expert help – for the very finest in all types of slings.

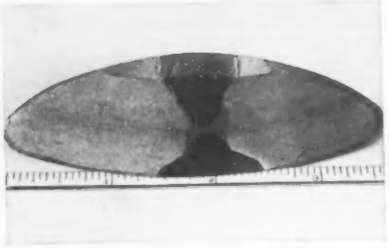
Yellow Strand®
BRAIDED SAFETY SLINGS



BRODERICK & BASCOM ROPE CO.
ST. LOUIS • PEORIA • HOUSTON • SEATTLE



Quality control at work on a Bethlehem 85-ft flat car



This 4-inch weld specimen gives inspector good look at weld quality. If it shows defects, a new weld is carefully supervised, and immediate steps are taken to correct the problem at the source. This is but one way in which Bethlehem upholds high level of quality on all freight cars.

What's this? Deliberately cutting up the center-sill cover-plate on a brand new piggyback flat car?

That's exactly what he's up to. He's holding a weld-prober, which cut the little boat-shaped specimen from the buttwelded joint in foreground. The specimen gives this quality control engineer a good look at the workmanship in the weld. If he spots any defects, such as slag inclusions, cracks, porosity, lack of fusion or penetration, he'll know what to do about them—*and he'll do it.*

The soundness of every weld and the quality of each part are essential to the service life of a whole freight car. That's why Bethlehem's quality control engineers are in the shops at all times, checking on every detail of construction, helping to overcome difficulties, often suggesting improvements.

It's paying off, too. We're developing such a high standard of excellence in car construction that one of these days we believe you will find it unnecessary to inspect our product. You will pocket the savings. We'd like to demonstrate our ideas of quality on your next order.

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.
Export Sales: Bethlehem Steel Export Corporation

Steel *for Strength . . . Economy . . . Versatility*

BETHLEHEM STEEL

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RAILWAY
LOCO-
MOTIVES
AND
CARS

America's Oldest Trade Paper
December, 1961—Vol. 135, No. 12
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REPORT FOR DECEMBER

More Liberal Depreciation Sought for Rolling Stock

Prospects are that the Internal Revenue Bureau may soon establish more favorable depreciation rates for railroad rolling stock. An administrative ruling allowing faster equipment write-off, a good possibility in the light of recent similar action involving the textile industry, would produce results which the carriers have been attempting to achieve in Congress. Depreciation reform would apparently serve to stimulate the buying of rolling stock.

For income-tax purposes, different types of railroad equipment have depreciable lives of up to 35 years. Railroads, their suppliers, the Railway Progress Institute, and the American Railway Car Institute are all making presentations which urge the establishment of a depreciation term of 15 years for rolling stock.

In a message to Henry H. Fowler, Under Secretary of the Treasury, declared the railroads and shippers owning rolling stock "have reached what we consider to be the major impasse in their economic development. Aside from rate-making restrictions, the greatest deterrent economically for the common carrier has been the unrealistic depreciation policy of the Government.

"A depreciation rate with a maximum of a 15-year life for rail equipment is an economic must for the survival of our common carriers and private owners and for the subsequent improvement in their ability to meet any transportation emergencies of the future."

Mr. Renz cited record cash outlays by the commercial car builders to develop new types of railway cars and services. He called these cars "the one bright hope for the railroads." But, he added, "in their straitened circumstances they have about reached their limit in purchasing." Liberalized depreciation is sorely needed, he told Mr. Fowler, "not only to restore the economy and competitive standing of the railroads, but to insure that the transportation backbone of this country will survive."

Turning to the depressed carbuilding industry, Mr. Renz said its backlog was "at its lowest ebb since the depreciation 25 years ago, despite the fact that this very industry has been utilizing all its resources in research and development to enable the railroad industry to have equipment which will be competitive and bring business back to the rails."

Secretary of the Treasury Dillon has revealed that shorter depreciation terms would be considered for all industries. What industries get "will depend upon their particular conditions and circumstances," the White House has said. BIR rulings on the railroad plea and similar presentations of other industries are not expected until next spring, but there is hope that they will apply to the entire year 1962.

Because rolling stock must be depreciated over periods up to 35 years, depreciation rates for the industry are well under 3%. This slow rate of recovery has made it difficult for the railroads to obtain financing for the badly needed new equipment.

To point up this problem, the AAR has stated a simple, factual situation: "What railroads are up against can be illustrated by their efforts to streamline the freight-car fleet. When railroads buy a freight car today to replace one costing $2,500 in the 1930's, they find that the price—due to wage increases, material costs and inflation, as well as many structural improvements—has risen to about $9,500. To obtain the $7,000 difference from net income under today's 52% corporate tax rate, a railroad must earn, before taxes, about $14,000."

What this kind of tax treatment forces the railroads to do, of course, is to use the depreciation allowances from several old cars to meet the current payments on a

TIME SAVING IDEAS FOR DECEMBER

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single new unit. The inevitable effect is the shrinkage of the freight-car fleet to a level that is now dangerous to the railroads' economic health, the needs of commerce, and the nation's defense position.

ACF Consolidating Carbuilding Facilities

Called "a step decisive in the continuing effort to alleviate historical feast or famine aspects" of the railway carbuilding industry, W. T. Taylor, chairman of ACF Industries, has announced plant consolidations which will result in the closing of ACF's Berwick, Pa., facilities late in 1962. At the same time, Mr. Taylor said ACF will cease to build passenger equipment, maintaining only design and engineering capabilities which will be available on a consulting basis to transit agencies and manufacturers.

All ACF carbuilding operations will be consolidated in Milton, Pa.; Huntington, W. Va., and St. Louis, Mo. Milton will build complete tank cars; Huntington will produce covered hoppers and open-top cars, and St. Louis will specialize in box cars, piggyback flat cars, and related equipment.

Mr. Haylor pointed out that while the railroads have been buying fewer standard general-purpose cars, those which are being acquired are more and more frequently built by the railroads, themselves. Railroads are relying on commercial carbuilders primarily for special-purpose equipment. Mr. Taylor said that the ACF consolidations should eliminate high-cost standby carbuilding facilities. ACF expects to be in an improved position to design and produce special purpose cars while retaining sufficient capacity for all standard car construction. "Consolidation and modernization at the three remaining plants will result in greater efficiency, reduced overhead, lower break-even point, and an improved competitive position," Mr. Taylor said.

Personal Mention

Central Vermont.—*St. Albans, Vt.:* DONALD L. SHEPARD appointed superintendent motive power and car equipment. *New London, Conn.:* GEORGE D. BENHAM appointed general foreman of motive power and car department, succeeding Mr. Shepard.

Chesapeake & Ohio.—*Grand Rapids, Mich.:* R. CLARENCE BLAKESLEE, car foreman, appointed car shop superintendent.

Fort Worth & Denver.—*Fort Worth, Tex.:* FRANK A. SMERKE, terminal master mechanic, retired.

New York Central.—*Cleveland, Ohio:* R. W. MUSTARD appointed mechanical superintendent, Western district, succeeding R. F. Batchman. *New York:* W. H. CHIDLEY appointed mechanical superintendent, New York district, succeeding Mr. Mustard. *Indianapolis, Ind.:* E. H. WRIGHT appointed mechanical superintendent, Southern district, succeeding Mr. Chidley. *Syracuse, N.Y.:* R. F. BATCHMAN appointed mechanical superintendent, Eastern district, succeeding Mr. Wright.

Orders and Inquiries for New Equipment

Placed Since Closing of November Issue

Diesel-Electric Locomotive Orders

SANTA FE. *General Electric:* 8 U25B 2,500-hp diesel units for use in high-speed freight service. for March 1962 delivery.

Freight-Car Orders

ATLANTIC COAST LINE. — Pullman-Standard: 350 50½-ft box cars; American Car & Foundry: 350 50½-ft box. These 700 cars include 500 50-ton cars equipped with lading band anchors; 100 50-ton cars equipped with sliding sill cushioning devices and damage free loaders, and 100 70-ton cars specially designed to handle heavy loads and equipped with long travel, sliding sill cushioning devices and damage free loaders. All roller-bearing equipped.

GREAT NORTHERN.—*General American:* 20 Airslide covered hoppers. For delivery second quarter 1962.

ILLINOIS CENTRAL.—*Pullman-Standard:* 100 70-ton covered hopper, for bulk grain commodities. Cost, $1,130,000. Delivered.

SEABOARD.—*Pullman-Standard:* 500 70-ton steel box cars to be equipped with roller bearings, cushion underframes, nailable steel floors, aluminum doors, and special protective bulkheads. Cost, $7,600,000. *Magor Car:* 95 90-ton jumbo-type, roller-bearing covered hoppers. *American Car & Fdry.:* 5 90-ton jumbo-type, roller-bearing covered hoppers. Cost of Magor and ACF covered hoppers $1,400,000. *Greenville Steel Car:* 300 70-ton open-top hoppers, costing $2,500,000; 200 70-ton steel woodchip cars, costing $2,500,000. Deliveries of these 1,100 cars to begin in February and be completed during spring of 1962.

SOO LINE.—*Bethlehem Steel:* 15 85-ft TOFC cars; Pullman-Standard: 40 box with lading protection devices. *Ortner:* 6 tinplate gondolas; 20 steel billet gondolas; 20 4,000 cu ft capacity covered hoppers. Cars part of a $1.3 million program authorized in September (RL&C, Oct. 1961, p 8).

SOUTHERN—*American Car & Fdry.:* 47 100-ton, 30,000 gal, rubber-lined tank cars for handling phospatic acid. Approximate cost, $987,000.

TRANSPORT LEASING. — *Pullman-Standard.* 11 TOFC cars. Cost $165,000. Delivered.

WESTERN PACIFIC.—*Thrall Car:* 10 100-ton, 4,000-cu ft stainless-steel covered hopper cars for bulk shipments of malt, rice, other food stuffs, and chemicals. To be built without center sills and with bodies of Tenelon. Can be unloaded pneumatically or through four center discharge gates. Estimated light weight, 57,000 lb.

Notes and Inquiries

Atlantic Coast Line will place orders in "in immediate future" for 300 covered phosphate hopper cars.

Great Northern has authorized its subsidiary, Western Fruit Express, to acquire 35 50-ft cushion underframe, insulated box cars, and 10 additional refrigerated trailers.

Louisville & Nashville has authorized expenditure of $3,580,200 for rebuilding 1,000 coal hopper cars in company shops, and $43,740 for installation of damage free type bracing in 18 additional box cars.

Missouri Pacific board of directors has approved $27-modernization program, including $7.7 million for 500 new roller-bearing freight cars and conversion of 200 existing flat cars for piggyback use. Also provided is $6 million for new diesel locomotives (RL&C, Oct. 1961, p 8).

New Haven will send 10 locomotives to Alco for rebuilding at a total cost of approximately $900,000. A federal court authorized the expenditure by the bankrupt road and also agreed to the sale of 428 old freight cars for scrap, proceeds to be applied to the cost of rebuilding the locomotives. The locomotives were built in 1950 and 1951.

Seaboard requesting bids on 150 70-ton covered hopper cars for use in transporting phosphate rock.



Frank E. Russell
SP



Norman L. McCracken
SP



Denman K. McNear
SP

Norfolk Southern.—*Norfolk, Va.:* Headquarters of M. B. DOWDY, chief mechanical officer, and W. A. MILLER, mechanical engineer, moved from Raleigh, N.C., to Norfolk.

Southern Pacific.—*San Francisco, Calif.:* Following are brief sketches of careers of newly appointed mechanical officers reported in November issue:

FRANK E. RUSSELL, chief mechanical officer at San Francisco, entered SP service in 1928 as a special apprentice at Sacramento, Cal., serving subsequently as night enginehouse foreman, shop foreman, assistant master mechanic, master mechanic, assistant superintendent motive power, and assistant general superintendent mechanical department -engineering.

NORMAN L. MCCRACKEN, assistant chief mechanical officer — maintenance, began work with the SP in the general shops in Sacramento, Calif. Subsequently appointed assistant master mechanic at Eugene, Ore.; and master mechanic, Tucson Division; master mechanic, Los Angeles Division; assistant general superintendent of motive power, and assistant general superintendent mechanical department.

DENMAN K. MCNEAR, assistant chief mechanical officer—engineering, started with SP in 1948 as a technical student on Sacramento Division. Subsequently served as assistant division engineer; construction engineer, engineering department, at San Francisco; trainmaster; assistant to general manager at San Francisco, and superintendent, Rio Grande Division.

Southern.—*Greenville, S.C.:* E. D. BRANTLEY appointed road foreman of engines, Charlotte division.

OBITUARY

John A. Brossart, retired assistant general superintendent of equipment of the New York Central, died October 25.



THE ILLINOIS CENTRAL'S FAST FREIGHTS KEEP PRECISE SCHEDULES WITH AN ASSIST FROM NATIONAL BRUSHES

TRADE-MARK

Modern railroads like the Illinois Central are using fast freights to bring improved service to their customers. Programs of this nature require trouble-free motive power with minimum lost-time for maintenance.

All the components in the locomotive, no matter how large or small, must offer rugged, dependable service to assure that these complex schedules will be met.

"National" generator brushes—small but vital components—offer proved commutation and life, and operate with the reliability so necessary for today's progressive railroad service.

National Carbon Company offers a positive carbon brush service program to help America's railroads provide improved freight delivery. To realize this assistance, just call your "National" Brush Man, or write National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N.Y. In Canada: Union Carbide Canada Limited, Toronto.



Contact your "National" Brush Man

UNION CARBIDE

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THE SOUTHERN PACIFIC'S FAST FREIGHTS MEET EXACTING SCHEDULES WITH AN ASSIST FROM NATIONAL BRUSHES

TRADE-MARK



Because of the Southern Pacific's fast-freight service, industrial customers served by this 14,900-mile rail network are permitted to maintain smooth production schedules with a minimum of inventory.

The close scheduling involved requires rugged and reliable service from fast freight diesel locomotives.

"National" traction motor brushes—wherever used on the Southern Pacific's 2,000 diesels—offer dependable commutation and life . . . and help keep motive power in service by reducing maintenance.

To meet today's constantly changing and more difficult electrical conditions, National Carbon Company contributes to improved railroading through a positive carbon brush service program. To realize this assistance, just call your "National" Brush Man or write National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N.Y. In Canada: Union Carbide Canada Limited, Toronto.



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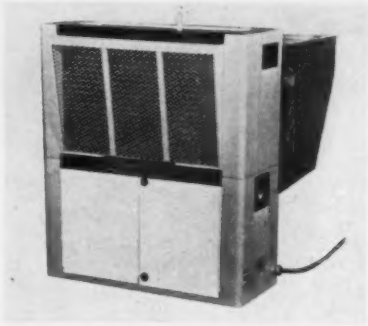
Heavy Duty Truck

The Super 70 Cary-Lift, suitable for handling loaded containers, has a capacity of 35 tons and a combination of hydraulic controlled lifting, reaching, fork tilting and side shifting movements to spot loads with precision. The maximum forward reach is 10 ft 8 in. and maximum height of lift with forks level is 17 ft 4 in. Forks can be tilted 12 deg back, 90 deg down, and entire assembly can be shifted 12-in. each side of center. The unit, which weighs 93,800 lb, is powered by a 350 hp Cummins diesel engine, and is equipped with power shift transmission, planetary axles and torque converter. Travel speeds range from 3.23 mph to 24.06 mph. Attachments include crane boom, buckets and dozer blades. *Pettibone Mulliken Corp., Dept. RLC, 141 West Jackson blvd., Chicago 4.*



Nozzle Lapping Process

The Hartridge Rapidlap is a diesel injector nozzle lapping machine with a specially designed lapping head assuring concentricity. It is said to reduce nozzle lapping time on an average reclaimable nozzle seat up to one-half the normal time. The machine can handle both small and large nozzles up to the U and V sizes and has high and medium speed spindles, providing two lapping speeds. The machine is mounted on a rotatable base. Its three-position headstock permits the machine to be swung into position for either right-or left-hand operation. No keys or spanners are needed on the special chucks, and Pintle nozzles can be serviced as well as American Bosch, Bendix Scintilla, Fairbanks-Morse and Caterpillar nozzles. *Diesel Injection Sales and Service, Inc., Dept. RLC, 1120 E. Brambleton ave., Norfolk, Va.*



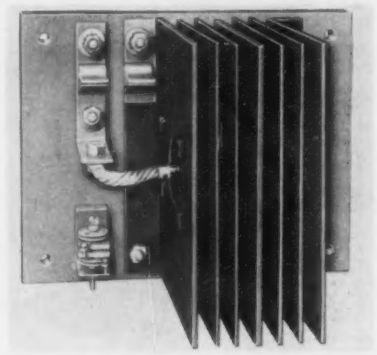
Refrigeration Units For Trailers

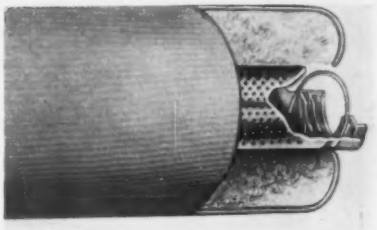
After extensive laboratory and road tests, four models of Frigiking Super Refrigeration units are now in production. The units—Super Models TR-250, TR-350, TR-500, and TR-800—are designed as a two-piece system consisting of an all-electric, hermetically sealed refrigeration package that mounts in an opening in the upper front wall of the trailer and a self-contained direct-connected engine generator from the trailer cross-members under the floor. Control of the system is automatic with a thermostat that provides either heating or cooling. The refrigeration unit operates electrically from output of the 230-volt, 60-cycle, 3-phase engine-generator power unit while in transit, or from a plug-in source when the trailer is parked.

For piggyback service or other unattended application, engine generator and refrigeration unit run constantly at between 1,800 rpm and 1,200 rpm. The units defrost automatically, utilizing electric heat. The air-cooled engines in the power units can be had for operation on gasoline, propane, or diesel fuel. *Frigikar Corp., Dept. RLC, 10858 Harry Hines Blvd., Dallas 20, Texas.*

Battery Charging Rectifier

Mechanical reverse current relays and a battery-charging contactor switch, which are subject to wear, burning, or misadjustment when used in charging banks of batteries, are eliminated in the new F-M battery charging rectifier for diesel electric locomotives. Four variations are possible with the rectifier which is designed without moving parts. Each of two base sizes can have either of two current ratings—160 or 240 amp. Each rating has two possible variations—300 and 400—in peak inverse voltage rating. Inverse voltage rating is said to be more than four times greater than the voltage rating of the charging system. *Fairbanks, Morse & Co., Dept. RLC, Beloit, Wis.*





Filter Cartridge

The Model SA-1349A cageless filter cartridge for diesel locomotive lubricating oil systems features a recessed gasket. It is said to have better sealing characteristics and longer filter life. The design keeps the gasket ½-in. from the outlet tubes of the filter housing, preventing distortion when the spider is tightened. *Superior Diesel Filter Co., Dept. RLC, 200 South Michigan ave., Chicago 4.*

Plate Edge Preparation Unit

The plate edge preparation unit is designed to cut a wide variety of plate edge profiles, using standard machine cutting torches with acetylene, natural gas, or propane. The unit, it is said, makes accurate cuts on standard straight edges as well as single bevels, double bevels, or bevels with a nose, and is especially suited for car building and reclamation operations. Cutting

(Continued on page 46)


new MAGPAD with NALUF



a low-cost lubricator that also has internal wicking and lock-stitched tufted cover

The heart of the new MAGPAD is NALUR — a specially formulated acrylonitrile foam rubber developed and produced by National Lead Company. It is highly resilient, has low oil swell characteristics and excellent resistance to compression set at high temperatures.

Outer cover is a heavy high-quality chenille, lock-stitched to withstand a 10-lb. minimum pull on tufts. End closures are tough cotton belting.

Ample internal wicking is provided by 25-ply candle-wick routed through ½" vertical orifices to provide unrestricted flow of oil.

Renovation—The MAGPAD with NALUR is sturdily made—its rugged construction permits renovation by any standard method in railroad use.

Get the full story on the new *low-cost* MAGPAD with NALUR. Ask our representative or write for details. Magnus Metal Corporation, 111 Broadway, New York 6, New York or 80 E. Jackson Blvd., Chicago 4, Illinois.

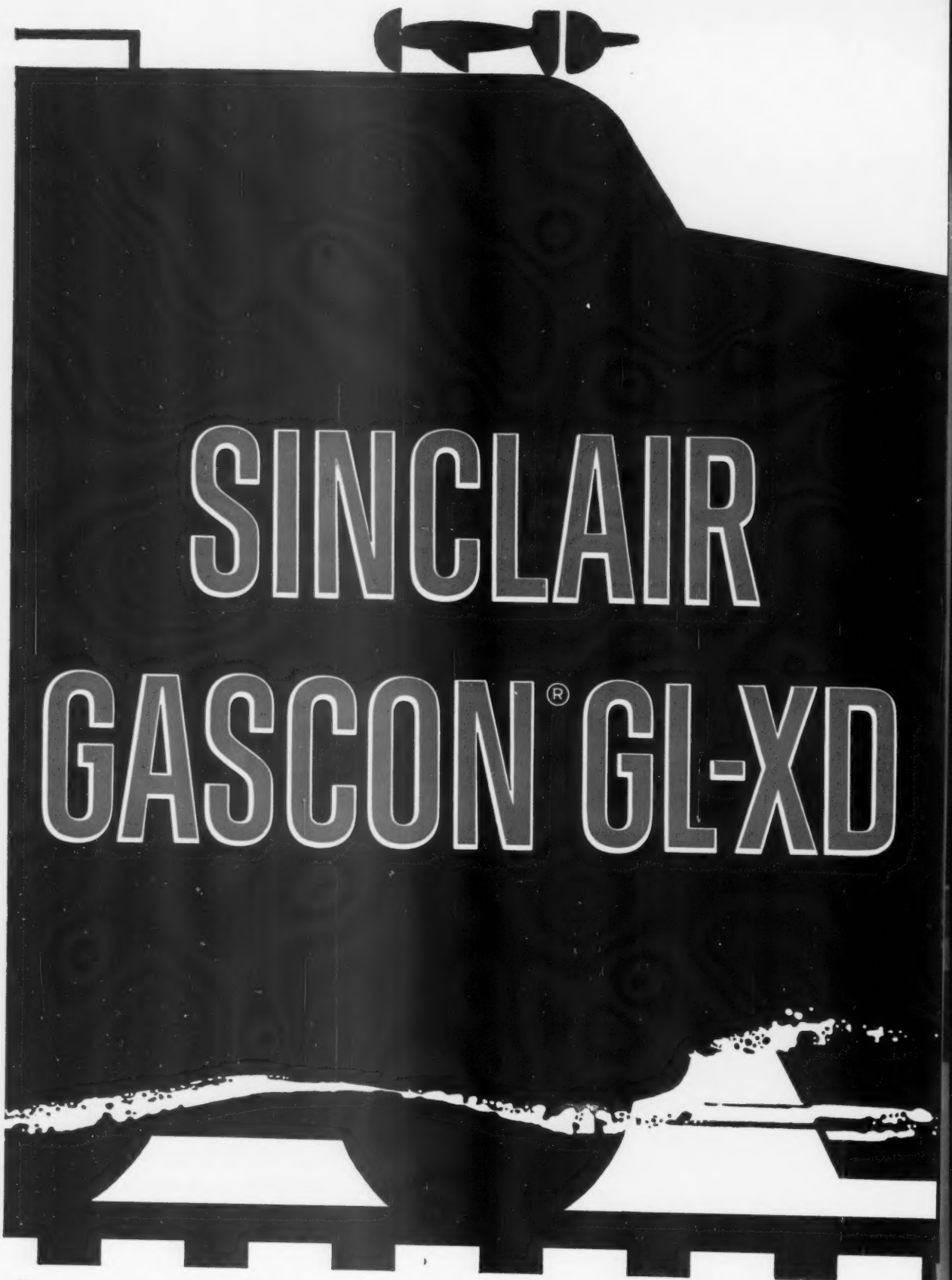
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SERVO REPORTS HOW

RAILROADS WAGE WAR
against the hot box scourge

Progressive carriers find infrared cure for 'hardening of the arteries'

"...save just one wreck, and the SERVOSAFE® Hot Box Detective* has paid for itself."



W. D. Murphy, Mgr., Conway Classification Yard, Pennsylvania Railroad, Conway, Pennsylvania.

Main arteries of peace and plenty, strategic lifelines during war and national emergency, the nation's railroads hold an important key to the nation's survival. Strategic network for carrying men and materiel, elusive mobile missile bases for launching a lightning counterstrike at an aggressor, the rails stand firm—one of the country's most dependable "secret" weapons.

Yet today's accent is on speed, as well as dependability, a decisive weapon in itself. Consequently, the railroads are busy taking the kinks out of winding track, scheduling fewer stops, and installing better and better equipment. Object: to give the highball to faster freights and other strategic rail movements.

But trains, like chains, are only as strong as their weakest link. As freights move faster, the railroads' traditional problem, the *hot box*, becomes even more severe. One undiscovered hot box, one journal burn-off—and many cars can end up in a pile of rubble.

In recent years, on the average, hot boxes have cost American railroads over $15 million annually. And this, just in derailments, damage, and delay. Yet consider the total "cost" of only a single derailment—life perhaps, costly litigation, maybe broader consequences.

FOR RAILROAD PROBLEMS: Rx

On November 16, 1956, the first complete installation of a SERVOSAFE® Hot Box Detective* was made on the lines of the Chesapeake & Ohio Railway Company at Norge, Virginia. Shortly afterward, writing in the C&O's 1958 annual report, M. I. Dunn, Vice President for Operations emphatically stated:

"I consider the hot box detector to be one of the greatest aids to railroading in many, many years. * * * Our tests have proved it 100 per cent effective."

Today, more than *three hundred* SERVOSAFE detective installations later, 28 major Class I railroads across the country (and abroad) are benefiting from the protection, savings, and other operating efficiencies of this amazing infrared safety device. A number of railroads have already begun installing infrared hot box detectors system-wide. New roads are swinging in daily.

Day in, day out, in all kinds of weather, no passing journal box can escape inspection and hot box detection by the super-sensitive, ever watchful infrared trackside scanners —the eyes that "see" heat. The Detective will give positive evidence of abnormalities on tape from spotting points 100 miles or more away. It will automatically sound alarms, set trackside signals to "stop."

The latest breakthrough, the "talking" Hot Box Detective, *radios* a passing train crew the exact location of a dangerously overheated journal anywhere from engine to caboose—all automatically. Before serious trouble begins, the engineer can stop the train or slow it down to avoid a fire, broken axle, or disaster.

WHAT COST HOT BOX... WHAT PRICE WRECK

Let's face the cold, hard facts. Survival may be at stake. *More wrecks result from hot boxes, than from any other single cause!* Figure that the average train wreck may cost a railroad anywhere between $40,000 and $500,000.

In the words of one railroad official, "... save just one wreck, and the SERVOSAFE Hot Box Detective system has paid for itself."—(Add the words, "many, many times over!")

REDS 'DISCOVER' INFRARED

Throughout the rest of the world foreign railroads are modernizing and expanding at feverish pace.

A sobering report was issued from Moscow last year that Russian scientists had "discovered" an infrared hot box detector amazingly like our own—and that the Reds were busy installing the device at strategic locations throughout the Soviet and satellite rail networks.

'Way before Russia, from the same house that pioneered the major breakthroughs in infrared aerial reconnaissance and in heat-seeking infrared missile guidance systems—came the solution to control of the railroads' greatest problem: the hot box.

Here is the proved method for protecting strategic bridges, tunnels, yards, and structures... for safeguarding major rail arteries and rights of way.

Here is the patented SERVOSAFE Hot Box Detective system, the amazing "eye that sees heat."



Wheels whirl by infrared sentinels of SERVOSAFE Hot Box Detective system, the "eyes that see heat." No passing journal box can escape inspection and hot box detection. The Detective charts heat of *all* journals ... instantly nabs dangerously overheated journal bearings, or "hot boxes."

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EDITORIALS

Think Big!

The Southern has in service an experimental 85-ft, 10,000-cu ft box car, a car so long there are skylights in the roof near the ends because the distance from the center doorways is so great. Since the adoption of the 85-ft flat car for piggyback service about three years ago, tank cars, gondolas, and now a box car have been built in passenger-car lengths. The end, figuratively—and almost literally—is probably not in sight. Despite rate regulations which may make it difficult to take full advantage of the high payloads which such high-capacity cars can handle, more and more of them will be built. Inevitably, other types of freight cars will also be built in these lengths.

Such developments mean that those responsible for designing freight-car servicing and maintenance facilities should have a new concept of what a "car length" is. In the future, instead of the traditional 50 ft, car length will probably be 85 ft, 90 ft, or even 100. While a railroad which did not have turntables and backshop facilities for long steam locomotives could choose not to acquire articulated motive power when it became popular, long freight cars will be no matter of choice for car departments. Because of freight-car interchange, all railroads will be confronted with handling and maintaining them. This means that the design of shop facilities should make provision for more than an occasional 85-ft freight car. Jacking arrangements, pits, lighting, and other details should now be laid out to handle such cars on a regular basis.

Another development which should receive consideration is the increased height of freight cars. Some tri-deck automobile piggyback cars have loaded heights well in excess of 18 ft. Some of the wood chip cars also tower well above what formerly would have been considered the maximum clearance limits. Because traffic handled in such specialized equipment has proved profitable, many railroads are making line changes which will permit them to handle high cars over many hitherto restricted parts of their systems. As is the case with the long car, the high car should receive consideration when designing shelters, cranes, lighting, and other facilities necessary for car maintenance. Sufficient overhead clearance should be provided so that these cars can be jacked and lifted when this work is required.

Along with new concepts of car size, provision should also be made for handling heavier running gear. While 90-ton trucks are adequate for the heaviest 85-ft freight car now in service, it is very possible that the 7 x 14 journal and the 40-in. wheel may, in the future, become standard freight-car details. Since the AAR Mechanical Division made the 36-in. wheel mandatory on new freight cars of over 70-tons capacity, a large number of 36-in. wheels have been placed in service. When planning wheel-shop and wheel-handling facilities, provision should be made for machining and moving even larger wheels and axles. At spot repair tracks, it might be well to consider the possibility of servicing six-wheel trucks. When all the potential carrying capacity in the four-wheel truck is exhausted, freight-car designers may turn to the six-wheel design for their biggest cars.

A growing number of larger and heavier freight cars will be requiring servicing and repair. Car officers should be planning for them now. In such planning, there is only one design criteria: THINK BIG!

Concentrated Rail Traffic

With the advent of push-pull suburban trains on the North Western and the Milwaukee, the diesel has apparently again encroached on the field of electric operation. The North Western will have 200 cars in service and the Milwaukee 40. The electrically heated and air-conditioned gallery coaches have much passenger appeal. Since the cars seat up to 162 passengers and the trains may be operated from either end, they are particularly effective in suburban service. It is the no-turn-around feature that duplicates an inherent advantage of electric traction.

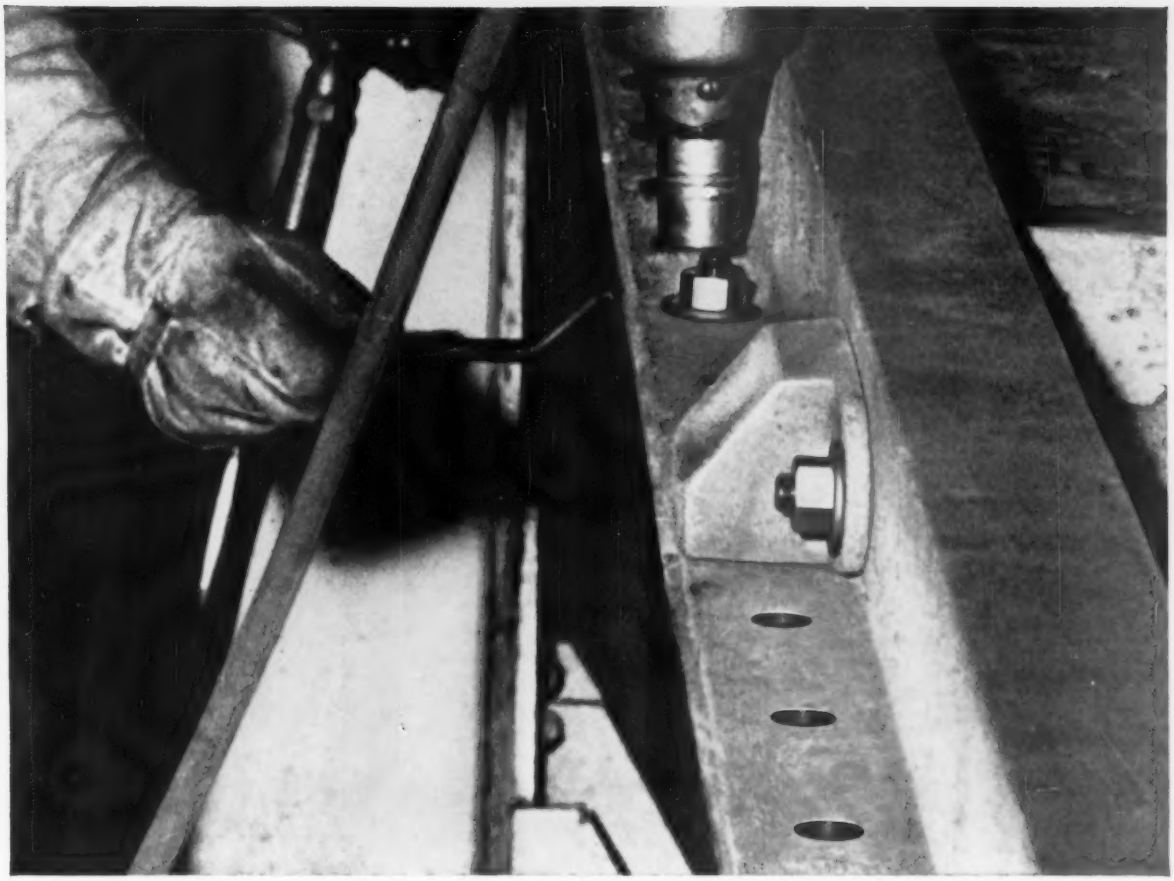
The situation raises the questions of what there is left for electric traction and will we ever have more. Original reasons given by railroads in the United States for electrifying run as follows: eliminate smoke in terminals and tunnels; carry traffic over heavy grade sections; improve suburban service; increase capacity with improved economy.

Installations of electrification through tunnels to eliminate the smoke hazards of steam locomotives have been eliminated where the diesel can negotiate the tunnel satisfactorily. Similarly, some electrified heavy-grade sections with a change of motive power at each end have been replaced by the diesel.

Rapid transit systems and subways, and some electric suburban service, must operate underground to such an extent that diesel power cannot be used. Present electric suburban service now provides accelerations between 1 and 2 mph per sec. This requires a power input of more than 5 hp per ton of train weight. As our cities continue to expand, the need for electric urban and suburban transport systems will increase.

To increase capacity with improved economy is success in any business. A number of applications of electrification in this country still fulfill the definition. New applications of electrification in other countries are many and are increasing. A basic reason is that here in this country we have many privately operated railroads; abroad, the railroads are for the most part under government control. In foreign countries railroads are recognized as a vital part of the national economy and the government can channel traffic and finance electrification of heavy traffic lines.

Government operation of railroads in this country is not anticipated. Mergers, however, are the order of the day and, to be successful, it is almost prerequisite that a merger must permit an increased concentration of rail traffic. Be it suburban passenger or heavy freight, electric operation has proved its capabilities and economic advantages in the field of heavy traffic.



New idea in car assembly saves shop time—speeds repairs

No matter *how* you assemble cars, you first have to pull the various members together with "fitting-up" bolts. That's where this new idea comes in:

Use RB&W High Strength Bolts for fitting up . . . *and leave them in place permanently.* This cuts idle time of riveting crews.

Now standard procedure prior to riveting certain types of cars in several roads' car shops, this idea eliminates extra operations, saves car assembly time, saves money. These bolts pull the steel together so much tighter, that the riveting job improves, too.

You can do this with high strength bolts because they are stronger than the rivets they replace. All in all, they make a stronger connection that stays tight despite constant rolling vibration and impact.

Of course, by using high strength bolts exclusively at *every* problem area where rivet failure happens too frequently, you stand to gain even more. For example: Bolted hopper cars stay longer on the road. Gondola cars are reinforced much faster. Accessory equipment is more securely mounted. Repairs can be made faster, easier.

RB&W has pioneered in this development for railroad car building and rebuilding, and offers engineering assistance in *where* to use the bolts, and how to install them properly. Consult us for specific details . . . or write for this bulletin. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.



Plants at: Port Chester, N. Y.; Corapolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco.

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"With all our motive power equipped with Cobra Shoes, our experience has been much better than we anticipated. Wheel life has been extended and we have eliminated wheel damage from braking."



"We have eliminated flat spots and thermal cracking of wheel treads since we installed Cobra Shoes."



"Cobra Shoe life and improved wheel performance have been a major factor in the over-all economies realized in the operation of our new Push-Pull trains."

These typical statements were made by men who have evaluated the important advantages of Cobra Shoes for several years. They're just some of the reasons why more and more railroads are specifying Cobra Shoes for new equipment, and modifying existing equipment to include Cobra Shoes.

Today 158 railroads are using Cobra Shoes on:

Freight Cars.....6086 (2003 Piggybacks)
Passenger Cars.....2300
Locomotives.....1164
Total Units.....9550

Why Cobra Shoe applications are expanding:

- Cobra Shoes last up to 5 times longer than cast iron shoes
- Wheel life can be doubled when Cobra Shoes are used

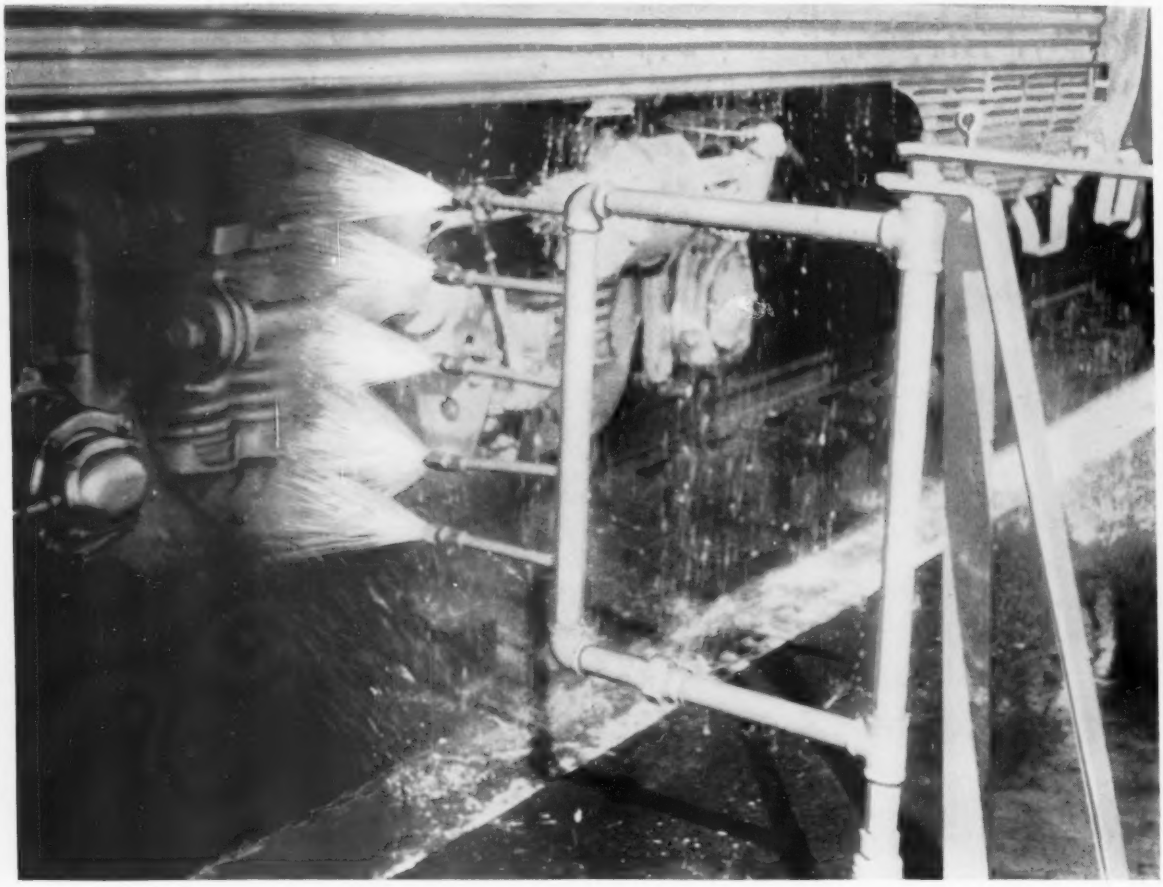
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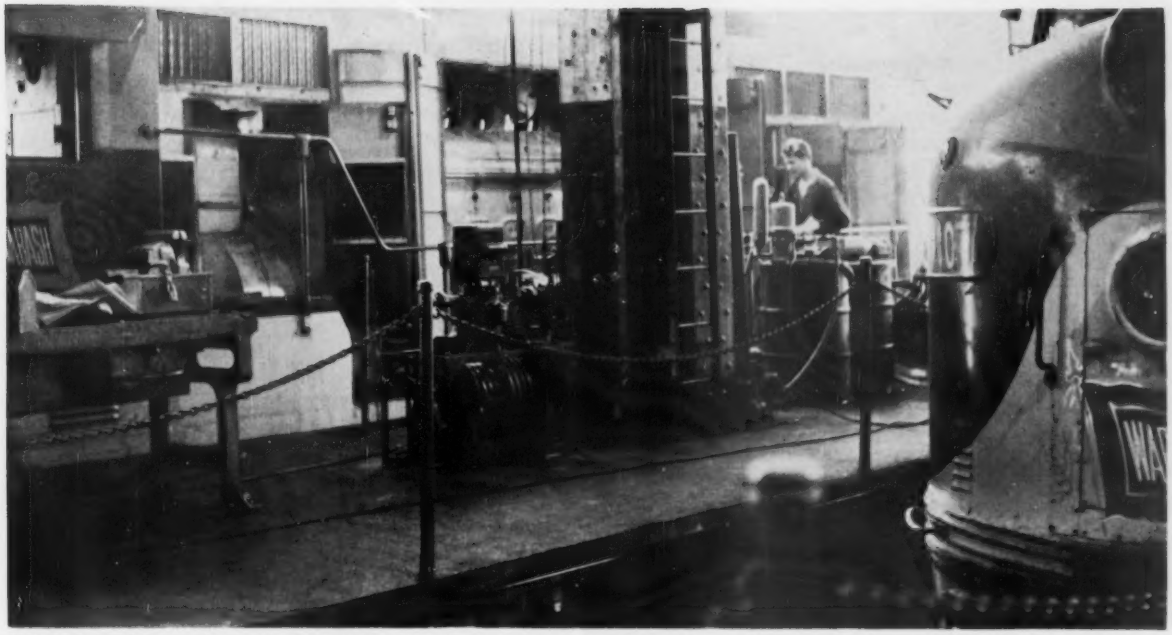
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Tools and servicing equipment are located along work platforms at the stations where they are required for tests and repairs.

'Spot' Line Handles Wabash Diesels

Road locomotive maintenance has been centralized; units come to shop twice monthly for maintenance

Wabash road locomotives, with exception of those used on its Canadian lines, are now maintained at the railroad's principal shop at Decatur, Ill. All this work is being done on a progressive, or "spot," basis. Decatur, which is at the approximate center of the Wabash system, is a key point in its freight operations. Freight locomotives, consequently, can be worked to and from this shop readily. Most Wabash passenger trains also operate through Decatur, giving the road an opportunity to maintain passenger locomotives at that point. Decatur shop presently handles scheduled maintenance for 205 diesel units on a progressive basis.

"Captive" diesel units are no problem on their progressive maintenance line, according to Wabash mechanical officers. At the September meeting of the Locomotive Maintenance Officers Association in Chicago one feature of "spot" shop systems which was discussed was that locomotives are "captive" once they enter a line (RL&C, Oct. 1961, p 18). Even if they are found to require unusual repairs, units on the line must continue through the routine maintenance cycle, not always the most satisfactory procedure according to some motive-power maintenance officers.

All units passing through the five-station line at Decatur receive scheduled maintenance and ICC inspections. When it is found that work on a unit cannot be completed while on the line which is Track 4, the unit continues through all five work stations. It is then diverted to Track 2 or Track 5 for needed repairs. If, for example, at Station 2 three power assemblies were found which required replacement, the unit would continue through Stations 3 to 5. It would then be placed on one of the "dead" tracks for this work.

The five-station line, which was put into operation on March 15, has an output of seven units per day with a three-shift operation and an average force of 70 handling both routine and unscheduled repairs. In addition to the 30-day maintenance, each unit also returns after 15 days for additional scheduled servicing. A back-up force supplies air-brake equipment and reworked locomotive components.

While nominally a three-shift operation, normal procedure calls for the seven units to be processed over the progressive line between 6 a.m. and 5:20 p.m. A force of 26 men handles all the ICC inspection and scheduled

maintenance on these locomotives. Three of four men handle the "15-day lubrications" which are worked on a separate track. Because each unit is scheduled for this 15-day lubrication just 15 days after its monthly maintenance, seven units also arrive in Decatur for this servicing each day.

The locomotive work program is based on a master maintenance schedule, applicable to any month and anchored on annual inspections. The schedule lists the ICC date for each of the 205 locomotives presently assigned. No more than two annuals are scheduled for any one day because of the heavy volume of air-brake work necessary on six-month and annual inspections.

Tracks 1, 2, 4 and 5 in the shop are equipped with the conventional arrangement of elevated and depressed platforms and track pits. Track 1, a through track, is assigned for the "15-day lubrication" of road units. This servicing is done 15 days after the monthly ICC inspection. It involves the following: check of oil in traction motor bearings, change of car-body filters, check of engine oil and batteries, application of brake shoes, renewal of traction-motor brushes, and making of minor repairs. Stub track 2 is the "dead" track where unscheduled repairs are made to units after they pass through Track 4, the progessive repair line.

Wheel Work

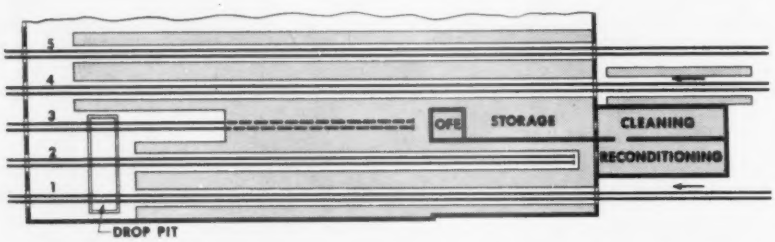
Stub Track 3 is equipped with a drop table and serves also as a storage track for spare trucks. A new 30- x 140-ft building at the west end of this track houses a recently installed wheel-truing machine. Units are routed into and out of the building from the west end. Tracks 4 and 5 are through tracks with Track 4 being the progressive line and Track 5 assigned for heavy repairs and unscheduled maintenance.

Track 4 has five stations for handling scheduled maintenance and ICC inspections. At each station a predetermined amount of work is done in one hour before the unit is advanced to the next station. Station 1 is outside the east end of the shop. Stations 2, 3 and 4 are inside. All mechanical inspection and testing is done at Station 2 and electrical work at Station 3. At Station 4, the engineroom and cab are cleaned. Final inspections are performed at Station 5 outside the west end of the shop. Here the engines are started, air brakes checked, and the unit loaded. If the unit then requires any unscheduled work, it goes to either Track 2 or 5.

Station 2 is completely equipped for servicing of mechanical components. Lubricants are piped along the track at this station. Inside the south rail are an Alemite line and a 1¼-in. oil line with six outlets, spaced at 10-ft intervals, for servicing journal boxes and traction-motor support bearings. Engine lubricating oil is piped through three meters on the upper platform. Under the platform, between Tracks 4 and 5, are water and air lines. Lubricating oil drain pipes extend through the pit, and the used oil can be pumped to the oil house.

Materials and tools necessary for the operation of Stations 2, 3, and 4 are placed along the upper platfrom at Tarck 4. Material racks are checked weekly and replenished by the stores department. Slower moving items are stored between Tracks 2 and 3 on the upper level.

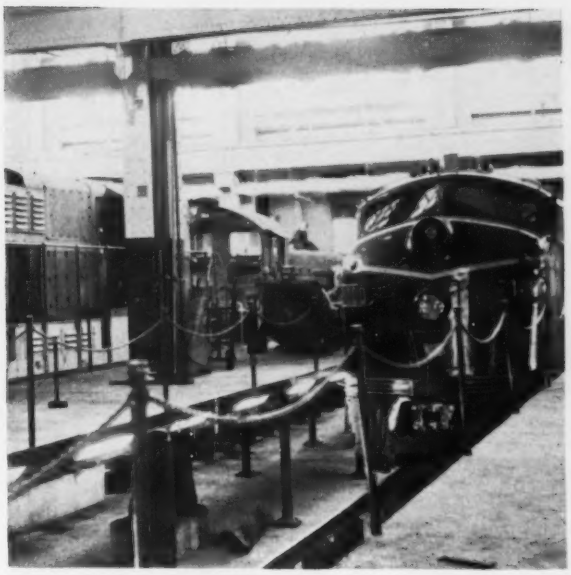
Track 4 operations start at 6 a.m. with third-trick personnel when the first unit is placed at Station 1. By 11 a.m. the first unit is completed and leaves Station 5. Other units by then are being worked on at Stations 1 through 4. Lights and horns along the track operate for five minutes prior to moving the line, signalling that units are to be moved. Locomotives are spotted at the work stations by a device which moves several units simultaneously by powering a traction motor on one unit from its batteries. This locomotive and those it is spotting can be stopped by reversing the



Progressive repair line has been set up on Track 4 in one end of locomotive shop. Extensions had previously been added to this building so multiple-unit diesels could be handled.



Parts storage racks are located adjacent to locomotive repair stations. Fourteen units are scheduled to come into Decatur locomotive shop for preventive maintenance each day.



Elevated and depressed work levels have proved to be valuable features of the progressive repair lines.



Truck repair track is arranged so completed trucks can be stored under elevated platform at rear center awaiting use.

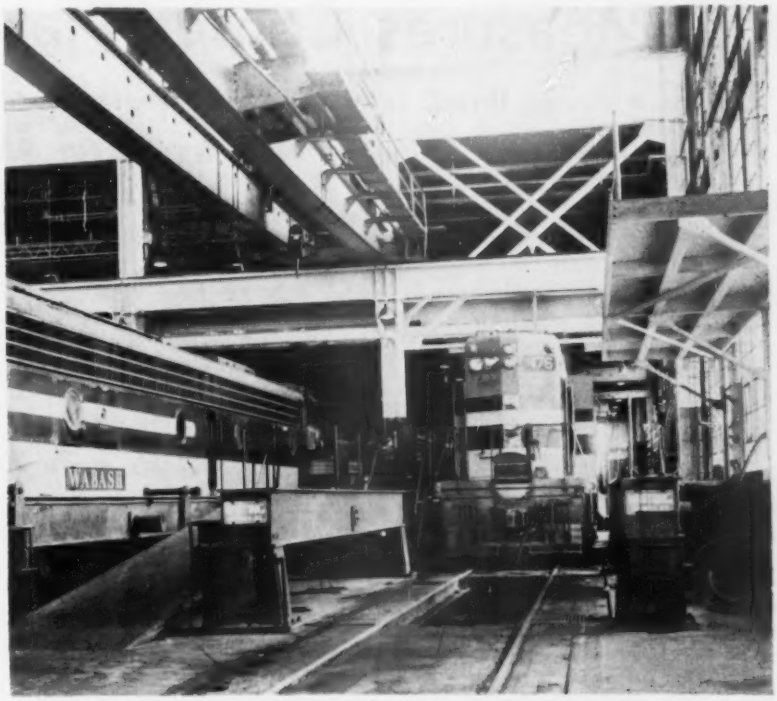
field of the traction motor. The spotting device may be operated by any of the shop crafts.

All work scheduled for the stations carries numerical designations. Each man does a predetermined amount of work at each station on each unit, based on an assigned work schedule. The schedule lists the regular monthly items and additional quarterly, semi-annual, or annual maintenance and inspections for which the unit may be due. It is in effect at the start of the first shift, and the assignment continues until the last unit passes through the stations. For example, schedule M-125 is a machinist working at Stations 1, 2, and 5. M-1-A is a machinist working only at Station 1 on the line.

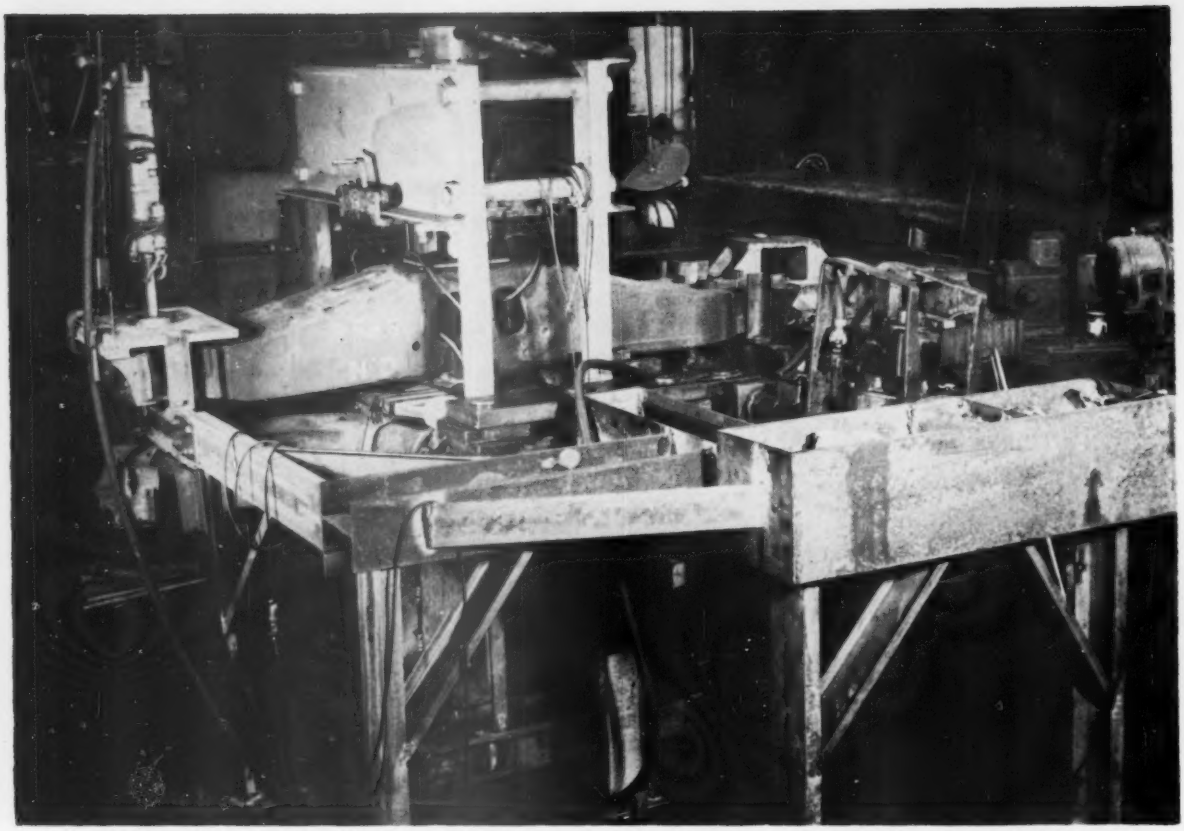
Work schedule sheets are kept at the east end of the shop between Tracks 3 and 4. Attached to a clipboard and placed on each unit at Station 1 are a master sheet, work schedule, the engineer's work report, the battery record, wheel report, lead-reading card, and other necessary forms. The clipboard and forms remain with the unit through all stations. The workman assigned is required to sign the master sheet for the work opposite his schedule when it is completed.

All types of locomotives are handled over the progressive track. When the line went into operation, 123 units were maintained at Decatur. These included 19 Alco road freight and passenger locomotives, eight Fairbanks-Morse road switchers, nine EMD road passenger units, 14 EMD road switchers, 59 EMD road freight units, and 14 switchers. On May 1, an additional eight EMD road passenger units were assigned at Decatur. On July 1, 33 more EMD road freight and road switcher units were transferred there from the Montpelier, Ohio, enginehouse. An additional 40 EMD road units started coming to Decatur for maintenance on July 16. These had previously been maintained at Moberly, Mo. This brought the total to the present 205 units.

Motive power on the Buffalo Division, extending across Canada from Detroit to Buffalo, continues to be maintained in Canada. Motive power on that district includes 22 F7 units, one GP7, and six switching locomotives.



Road switcher at center is coming through Track 1, the "15-day" line. When units must be set out for wheel work or other unscheduled repair, they go on adjacent track.



Testing machine, built by Canadian National, makes it possible to vary load, rotate the center plates, and vibrate them to simulate operation.

CN Measures Center Plate Friction

Work is aimed at finding proper surface treatment or a better lubricant for this important bearing

By W. H. Cyr

Reduction of center-plate friction in freight cars could cut center-plate wear; make it easier to maintain side-bearing clearances, and reduce flange wear on the wheels. The Canadian National is conducting tests to determine, under laboratory conditions, the friction forces between body and truck center plates under various center-plate surface and lubrication conditions.

Certain railroads have adopted center-plate lubrication more elaborate than the greasing required by interchange rules. Some roads have specified that all center plates should be machined and lubricated with molybdenum disulphide or grease. Other railroads have specified that new center plates should be sand-blasted and lubricated with a 50-50 mixture of varsol and molybdenum disulphide. To date, the CN laboratory has determined that greases and free molybdenum disulphide do not last long enough to give satisfactory lubrication.

From a paper presented by Mr. Cyr, chief mechanical engineer, Canadian National, before the 1961 ASME Winter Annual Meeting.

Center Plate Lubrication

If there were no economic considerations, a very satisfactory center-plate bearing could be designed—one having long life and very low coefficient of friction. Such a bearing could be used on new cars and, conceivably, might be applied to freight cars already in service. The present bearing is very crude and relatively inexpensive. If it is advantageous to reduce center-plate friction, an ideal solution would be to find a suitable lubricant for the bearing as it is now built.

It is, indeed, quite possible that road tests will show that low center-plate friction increases wheel-flange wear and promotes excessive shimmy in service. In order to determine whether lubricated center plates are desirable or not, however, a satisfactory method of lubrication must first be found.

The CN tests involve rotating of truck and body center plates one against the other and measuring the torque required for rotation. This is

done under varying loads and with different types of lubrication.

Two truck bolsters with integrally cast center plates are used. These bolsters, placed one on top of the other, are clamped to prevent horizontal movement. Two body center plates welded back-to-back, are placed between the fixed bolsters. The center plates used in the initial tests had been removed from cars in service and were worn. A vertical load is applied on the bolsters by a hydraulic ram, and the center plates between the bolsters are rotated by an air-operated jack. When tests are made requiring a large number of reversals of rotation, the air jack is replaced by a double-acting pneumatic cylinder and piston. This cylinder has been equipped with limit switches to automatically reverse piston motion. The machine can be operated for long periods without attention.

Vibration Effects

An attempt was made to vibrate the center plates while the torque was being measured. This was done by impacting the top bolster with an air hammer. While no attempt was made to reproduce the type of vibration imposed on the center plate in service, some idea of the effect of vibrations on the friction was obtained.

The test program first obtained torque measurements for the center plates in the condition in which they were found in service and after being lubricated with a 50-50 mixture of molybdenum disulphide and varsol. The center plates were then machined to a 120-microinch RMS surface finish and new torque measurements obtained under unlubricated and lubricated conditions. Following these tests, another set of center plates was removed from a car in service and lubricated with molybdenum disulphide. The change in coefficient of friction of lubricated center plates after a large number of rotations of the plates was investigated.

Results obtained during the initial test have shown the differences which might be expected in torque and coefficient of friction with various center-plate conditions. If low frictional resistance is required, the greatest advantage is to be gained by lubricating unmachined center plates. Lubrication with molybdenum disulphide reduced the coefficient of friction of unmachined center plates from 0.34 to 0.06. Under a 25-ton load, the torque was reduced from 6,927 ft-lb to 1,327 ft-lb. Lubrication of the machined center plates reduced the coefficient of friction from 0.12 to 0.11 with a corresponding torque reduction from 2,450 ft-lb to 2,200 ft-lb under a 25-ton load.

The 0.34 coefficient of friction of an unmachined and unlubricated center plate reduced to 0.12 after machining. The unlubricated, machined center plates tended to plough and tear severely, making them unsuitable for service. The lubricated, unmachined center plates had a coefficient of friction of 0.06, while the lubricated machined center plate had a coefficient of friction of 0.11.

Rotation Studies

When there was no vibration, the coefficient of friction remained approximately constant irrespective of the load. When vibrated, the coefficient of friction decreased slightly as the load was decreased from 50 to 12 tons. The decrease was of the order of 0.04.

Having found the coefficient of friction which could be obtained with molybdenum as a lubricant, tests were then carried out to determine what effect a large number of reversals of rotation would have on the lubricating qualities of this material. The frequency of reversal of center-plate rotation on a freight car in service has been measured at 2 cycles per min on tangent track. It was decided to test the endurance of molybdenum disulphide for 72,000 cycles, which is equivalent to about six months of continuous service.

Although molybdenum disulphide produced a low coefficient of friction when it was first applied, the coefficient increased with the number of cycles of center-plate rotation. Several tests were made showing that a sharp increase in the coefficient could be expected after 12,000 cycles of rotation. It was determined, however, that the life expectancy of molybdenum disulphide was too short to justify its use.

Other methods of lubrication were then tried. These involved greasing of the center plate, inserting a disc-type liner between the male and female plates, and bonding a coat of graphite on the male center plate. With the center plate lubricated with a good grade of grease, the coefficient of friction increased gradually until the coefficient of the unlubricated surfaces was reached. The test was then discontinued.

Disc-type liners of various thicknesses having an outside diameter slightly less than that of the female portion on the bolster and with a 3-in. hole in the center were tested. These liners were made of different materials, such a compressed graphite, nylon, babbitt-molybdenum-disulphide composition, and asbestos weave impregnated with graphite. Due to the slight lateral movement between the center plate and the bolster, the thin liners curled around the outside edges and the center hole was torn. The thicker liners did not curl around the outside, but the center hole was torn and the bearing surfaces were galled more than was the case with the thin liners. Rapid deterioration of the liners under load resulted in high coefficients of friction, and the tests were discontinued. At present, tests are being conducted with lubricants, such as thermo-setting graphite, bonded to the center plate.

Mechanical Division Position . . .

"Proper lubrication of center plates has continued on the docket for a considerable time. While a number of railroads have tested different materials, nothing [specific] has been developed. Materials [have been furnished] for use on center plates that were definitely of no value; in some cases were detrimental to proper lubrication. A subcommittee has been appointed to study this matter, and it is hoped that shortly a specification for a proper lubricant for center plates will be produced." *From the report of the Committee on Lubrication of Cars and Locomotives presented at the 1961 AAR Mechanical Division meeting.*

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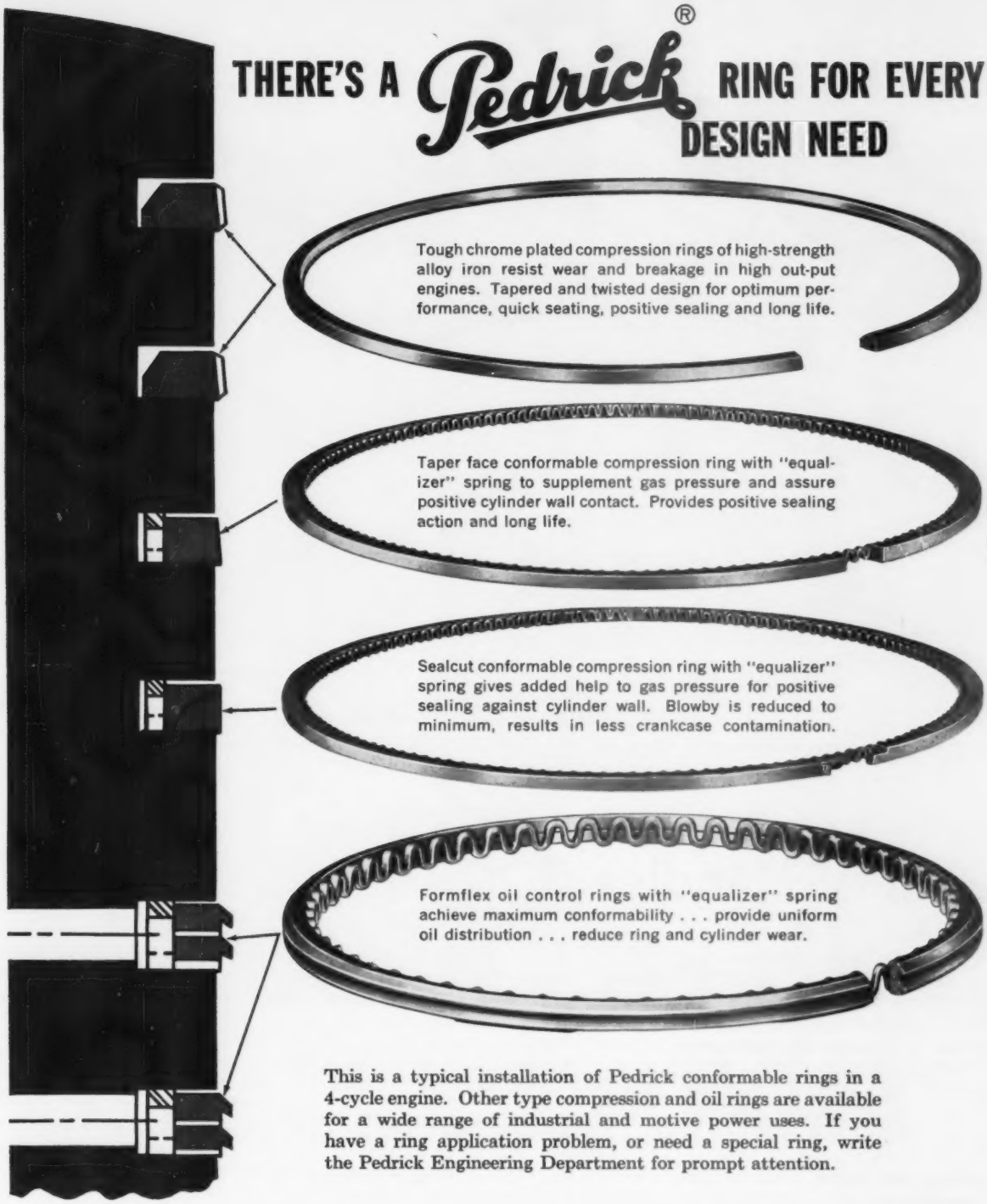
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Sealcut conformable compression ring with "equalizer" spring gives added help to gas pressure for positive sealing against cylinder wall. Blowby is reduced to minimum, results in less crankcase contamination.

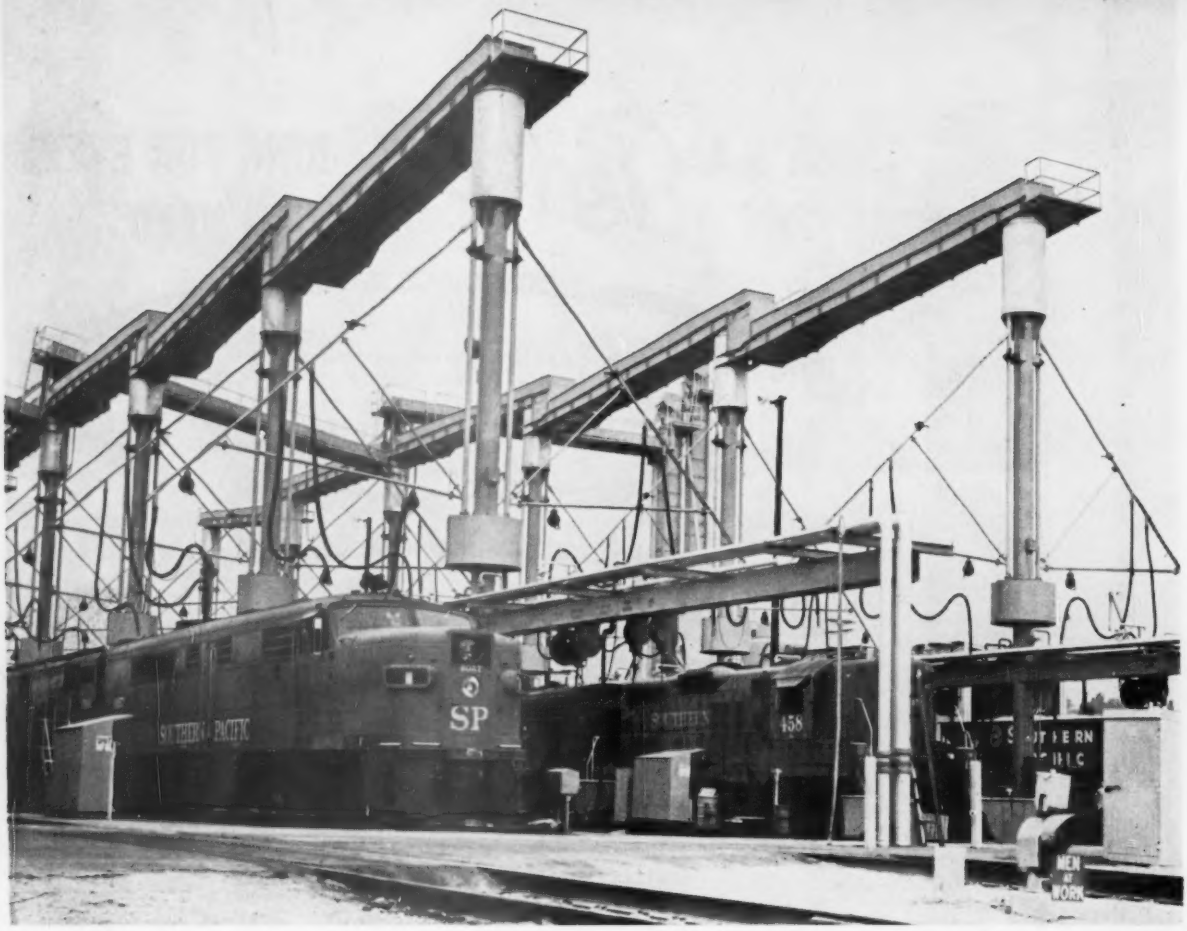
Formflex oil control rings with "equalizer" spring achieve maximum conformability . . . provide uniform oil distribution . . . reduce ring and cylinder wear.

This is a typical installation of Pedrick conformable rings in a 4-cycle engine. Other type compression and oil rings are available for a wide range of industrial and motive power uses. If you have a ring application problem, or need a special ring, write the Pedrick Engineering Department for prompt attention.

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Manufacturers of Pedrick rings; Superior-Arrowhead, White, Gillett & Eaton pistons; cylinder assemblies; oil, air and fuel filters. Iron and aluminum casting facilities available.





Sanding towers are located at unit-length intervals between pairs of tracks so that six units may be serviced simultaneously.

Southern Pacific 'Launching Pad'. . .

Facility Handles 200 Units Daily

Designed to apply line production techniques to diesel locomotive servicing, the new Southern Pacific facility at Taylor Yard in Los Angeles has been nicknamed "The Launching Pad" because of its space-age appearance.

Most prominent features are the 13 five-story high sanding towers. In addition to the high capacity sand handling equipment, specialized facilities have been installed for cleaning, inspecting, and fueling the 200 diesel units which are serviced during an average 24-hr period at Taylor Yard. According to J. K. Edwards, SP Los Angeles Division master mechanic, the facility has the potential capacity to service up to 400 units daily.

There are 4½ miles of approach track and five 350-ft long one-spot servicing pits. These servicing tracks handle six-unit locomotive consists without extra switching. Each locomotive passes through a wash rack which cleans in a three-cycle operation. The approaching diesel first trips a preliminary rinse switch, then another which applies a special detergent solution, and, finally, one which triggers a final rinse through 800 psi spray nozzles.

Under normal traffic conditions, approximately 80,000 gal of diesel fuel daily fill the tanks of the 200 units serviced. Sand consumption during a week runs about 120 tons, although this figure varies with weather conditions. Three types of water are dispensed through overhead hose reels to fill varied requirements: raw water for general uses, soft water for steam-heat generators on passenger locomotives, and treated water for use in diesel-engine cooling systems. All fuel, water, and sand hoses are located so a locomotive need not be moved once it has moved in for servicing.

Another time-saver is an intercom system with hi-level paging speakers and low-level talk-back speakers which enable foremen to communicate with all personnel.

Typical of the materials used in construction of this facility are more than 10 miles of pipe and conduit in the superstructure, 5,000 cu yd of concrete in the foundation, and 3,300 tons of structural steel.

The SP has also been a pioneer in developing line methods for preventive maintenance and inspection of locomotives. Its first such diesel shop was established at Ogden, Utah (RL&C, Dec. 1960, p 23). The Sacramento, Cal., shop has also been rearranged for spot maintenance.

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NUVAT, Wyandotte's heavy-duty vat cleaner, cuts your cleaning costs three ways. It rapidly removes soils other vat cleaners won't touch—there are no do-overs, no hand cleaning on benches. You spend less time rinsing because NUVAT solutions don't deposit scum on parts or tanks. And NUVAT lasts longer in your tank—cutting dumping downtime and the need for frequent material additions. Prove NUVAT for yourself. Call in your Wyandotte railroad-cleaning specialist.

The Revolutionary GENERAL MOTORS GP-30

The Revolutionary GP-30 . . . a new 2250 horsepower combination high-speed, heavy-drag general purpose locomotive . . . thirty major advancements . . . a new concept of locomotive reliability . . . dramatic savings in operation and maintenance . . . the single most important motive power development since introduction of the first Diesel powered FT locomotive in 1939 . . . offering the greatest return on investment in the history of American railroading.

Widest range locomotive on the rails, the GP-30 extends operating range 21½% over Model GP-20 . . . provides 12½% greater capacity for high speed operation as well as drag on grades . . . operates in a mixed consist with lower horsepower units with no reduction in the capabilities of either locomotive . . . maintains adhesion over the entire range with a new wheel slip and load control system. (For example, at 12 miles per hour, the continuous tractive effort is 50,000 pounds, a 21% improvement based on 71 miles per hour top speed.)

Advancing the trend established by earlier General Motors locomotives, the GP-30 dramatically reduces maintenance and operating costs. Advances are measured in terms of the D-22 generator (service life has been extended 50%) . . . the advanced central air system which eliminates car body filters and provides ambient filtered air to all components that use air . . . a new secondary engine filtering system requiring maintenance only once each year . . . the rugged air compressor capable of running at 100% load factor with maintenance intervals extended one year . . . lube oil filters that go 60 to 90 days between changes . . . and up to 10½% improvement in specific fuel consumption over the Model C engine.

Increased capacity of the GP-30 permits operation of present freight schedules with fewer units—two GP-30's replacing three older units on most operations. (And the new GP-30's will pay for themselves within four years when purchased through the Electro-Motive Locomotive Replacement Plan, offering 25% greater economy than the GP-20, protecting the railroad's equity in older motive power).

ELECTRO-MOTIVE DIVISION · GENERAL MOTORS

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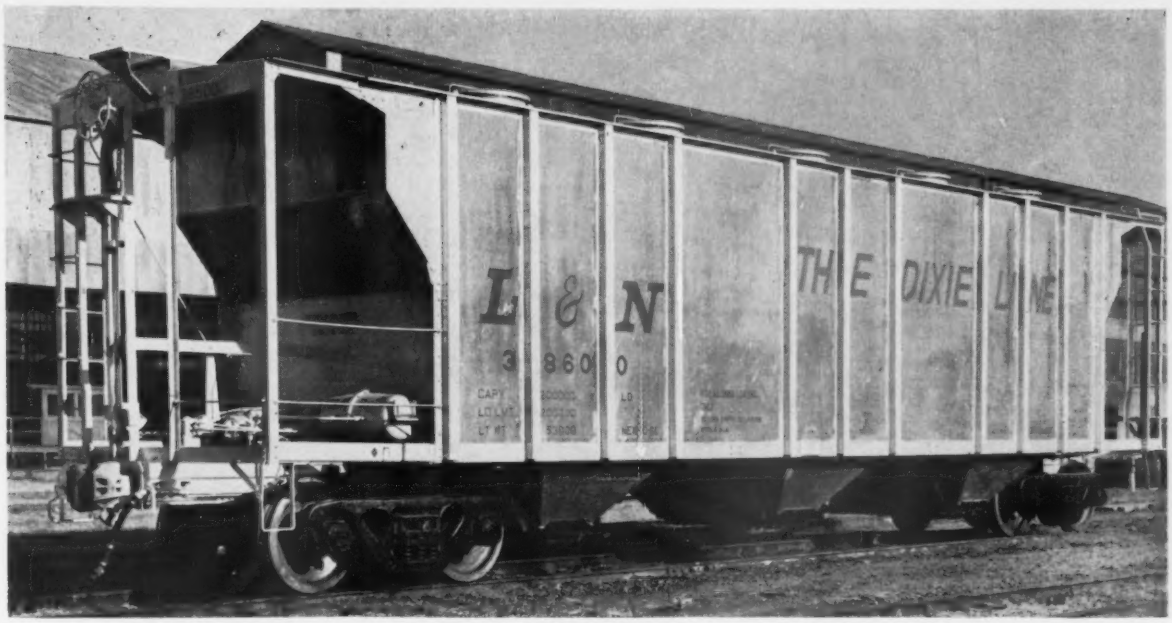
"We of the Mechanical Department on the Missouri Pacific find Railway Locomotives and Cars a very useful medium for obtaining information on a great variety of subjects related to our work and problems, including well illustrated news stories about what other roads are doing and about new developments in design and maintenance of railroad equipment. Special features dealing with maintenance problems are always educational and helpful."

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Cars have roller bearings, multiple-wear wrought-steel wheels, and 2½-in. travel springs. Use of aluminum reduces weight over 10,000 lb.

Aluminum Covered Hoppers for L&N

Hundred-ton, all-welded covered hopper cars, based on the PS-2 covered hopper design, are being built by Pullman-Standard for the Louisville & Nashville. Designed for handling alumina from Mobile, Ala., to Alcoa, Tenn., the car body is constructed of 10,500 lb of Alcoa aluminum alloy 5454 plate, extrusions, and castings. The car's light weight is 53,000 lb—10,000 lb lighter than comparable all-steel cars. The 40 cars are being built at the Pullman-Standard plant in Birmingham, Ala.

The center sill is made of two steel 51.2-lb AAR Z-26 sections. End posts and underframe members are copper bearing steel. The two end roof sections are also steel.

Side sills are 6- x 3½-in. aluminum angle extrusions, and side plates are bulb-angle extruded sections. Aluminum plate, 5/16 in. thick, is used for all body sheets, except the outside hopper sheets which are 3/8 in. and the intermediate roof sheets which are 3/16 in. thick. All 18 side stakes and the eight carlines are aluminum channel extrusions. Partitions are flanged to form additional roof supports. The cars have ten circular hatches with 30-in. diameter cast-aluminum hatch frames and 3/16-in. covers.



Body parts contacting lading are all heat resistant 5454 aluminum. Alumina is loaded hot.



Body is an all-welded structure. Design corresponds to the conventional PS-2 car.



Capacity is 3,506 cu ft.; length over strikers 41 ft ¾ in.; height 13 ft 11-3/16 in.

Wilson Car Lines Findings . . .

Uneven Braking Affects Wheel Wear

Freight-car wheels may not wear uniformly because of the unbalanced braking forces which apparently exist in standard freight-car trucks. This conclusion has been reached following nearly four years' operation of 400 Wilson Car Lines refrigerator cars, during which brake-shoe replacement patterns have been carefully determined. Two years ago Railway Locomotives and Cars carried the first report on this investigation (Sept. 1959, p 57).

J. R. Jennings, general manager of Wilson Car Lines, last month told the ASME Railroad Division that "attention is naturally directed toward the brake rigging. Brake rigging has always been subject to compromise. The truck design with the rod under the bolster has involved increasing maintenance as train speeds increased."

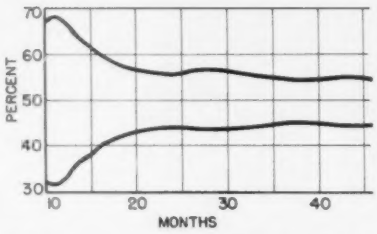
Larger capacity cars and longer spring travel brought clearance problems which resulted in a modification of the "rod under" design to a "rod-through-the-bolster" arrangement. It has been known that this design is unsymmetrical and produces unsymmetrical forces tending to rotate the brake beams in a counterclockwise direction in a horizontal plane.

The effect is a crowding of the L-1 and R-2 brake shoes into the flange portions of those wheels, with the mate shoes being moved toward the rims of the R-1 and L-2 wheels. This, however, is not necessarily the sole cause of uneven brake shoe and wheel wear. "A review of the design, standards, and specifications of all items appears to be in order," Mr. Jennings said.

The standard method for designating wheel locations on cars is to number the axles from the handbrake end of the car and to designate right and left while facing the exterior of that end. This produces designations R-1, L-1, R-2, L-2, etc., which are used in describing brake-shoe replacements.

A summary of brake-shoe replacements would apparently indicate:

- Wheel wear is probably associated closely with the pattern of shoe replacements; this cannot be substantiated fully on the basis of information now available.



Brake-shoe replacements at four "high" positions have consistently run higher than the replacements at the four "low" positions.

- Approximately 10% more brake shoes are replaced at the four positions L-1, R-2, L-3, and R-4 than at the four mating positions.
- Approximately 9% more shoes are required at R-2 and L-3 than at the mate locations and approximately 12% more shoes are required at L-1 and R-4 than are required at the mate locations.
- Braking forces apparently do not act through the wheel center lines and are the most probable cause of this shoe replacement pattern.

"This does not imply that any particular component or the equipment design is the primary cause of these results," Mr. Jennings commented.

A study of brake-shoe replacements was originally initiated to determine the service that would be obtained from AAR cast-iron brake shoes on 400 WCLX refrigerator cars which were approximately 10% heavier than earlier cars. The cars, built in 1957, were equipped with standard AB brake equipment and brake rigging, No. 18 unit brake beams, and 1½-in. cast-iron shoes, all typical of standard freight-car equipment. Two hundred cars were equipped with cast-steel wheels and 200 with one-wear, wrought-steel wheels. Shoe replacements are recorded on each car showing the wheel location, month replacement is made, and whether work is done by a railroad or Wilson forces. Because the location of shoe replacements is not required on interchange bills, complete information is not available for all of the brake shoes replaced by railroads.

Of the 9,237 shoe replacements, locations were not identified for 17.2%. While complete information on the unidentified replacements might cause some adjustment in the results, it has been assumed that the identified replacements are representative. There is no clear indication that shoe replacements on cast-steel wheels differ appreciably from replacements on one-wear wheels.

Usually brake shoes are replaced one shoe at a time. Even though this meets Interchange Rule requirements, Mr. Jennings feels that it may not be economically and operationally desirable. If shoe wear were uniform enough to make possible brake-shoe replacements in complete car sets, it would seem to offer potential economies. Studies by Wilson Car Lines of its AAR bills and its own shopping costs indicate that, in some months, 70 to 90% of the total cost of maintaining 4-yr old refrigerator cars involves brake-shoe replacements. This should provide sufficient incentive for an evaluation of the present brake arrangements, Mr. Jennings said.

Establishing a relationship between wear of wheel treads and flanges, and brake-shoe replacement patterns has not been easy. There is no standard procedure for determining wheel wear at the tape line on the tread and in the throat of the flange, points which fix wheel condemning limits. Measuring tread and flange contours to determine wear is not completely satisfactory but seems to be the best available method for obtaining wear patterns. Any factor producing unequal wear on equal tape-size wheeels soon changes the circumferential measurements. This can happen when lateral movement of a brake beam thrusts one shoe against the flange of one wheel and moves the other shoe toward the rim of the mating wheel. Once a difference is established, all factors combine to accelerate the wear rate.

Wheel contours obtained from several cars in the test group give reasonably conclusive evidence that the wheels in the positions where there is a high rate of shoe replacement will be the first to wear to the condemning limits. As would be expected, for example, the wear rate on L-1 and R-4 wheels is usally faster than on the R-2 and L-3 wheels.



*Patent Pending

NEW! Wine Power Geared* Discharge Gate

EVEN UNDER A 70-TON LOAD one man can open this new gate. Accurately machined mating surfaces provide bind-free operation and a tighter seal. No more sledging or car damage in attempts to open "frozen" hopper doors. Electric steel castings eliminate distortion.

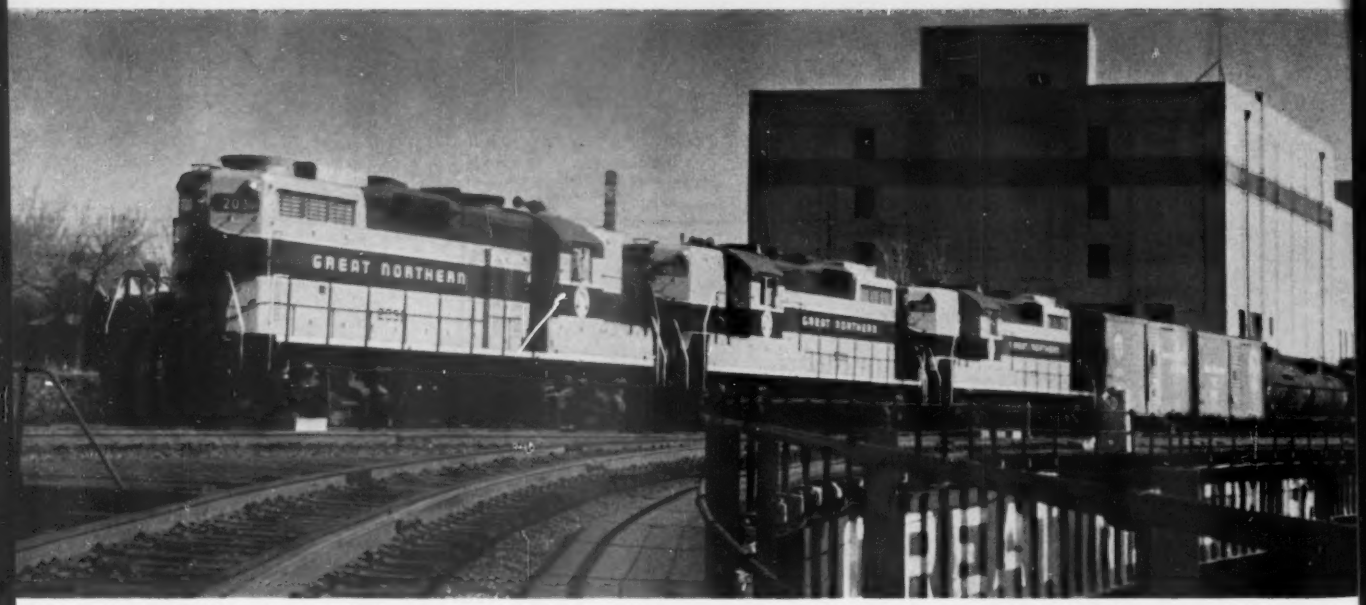
PRECISION-MESHED GEARS without costly machining! Amazingly accurate shell molding process helps keep unit competitively priced despite *Power-Gear* features. Rack-and-pinion principle assures parallel operation without side binding. All bearing surfaces are lubricated with Moly Disulfide.

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GP-20 diesels like these three were used in tests showing performance of slip suppressing brake on locomotives in multiple unit control.

GN Tests Slip-Suppressing Brake

Single-unit and multiple-unit operations have proved effectiveness of air brake control of wheel slipping

Correction of locomotive wheel slip with automatic light brake applications has proved to be an effective method for improving freight-train handling and locomotive performance. This was the conclusion of the Great Northern mechanical department following four months' testing of a GP-20 fitted with the New York Air Brake pneumatic wheel-slip-control system and after a 1,900-mile test run when three units with the NYAB equipment were operated in multiple. The GN plans to equip more locomotives with this control system during 1962.

Suppression of wheel slip on locomotives with an air-brake application is not an entirely new idea. On steam locomotives some enginemen would initiate a light independent brake-valve application when drivers slipped. In recent years a manually operated "anti-slip" brake has been employed on single-unit electric locomotives in Europe (RL&C, January 1957, p 46).

Higher horsepower ratings of diesel-electric locomotives for high-speed freight service complicate the wheel-slip problem. In 1953 New York Air Brake, collaborating with General Electric, started to develop pneumatic slip control which would have the necessary speed of brake application and, at the same time, be economical to install on new and existing locomotives. Tests were conducted first in the NYAB laboratory and, later, in the field, cooperating with General Electric which was then developing its 2,500-hp U25B (RL&C, March 1961, p 31).

The traditional method for correcting wheel slip on diesel-electric locomotives is reduction of power either manually or automatically. This will invariably decrease the train's speed. To control wheel slip without serious loss of tractive effort the pneumatic wheel-slip control makes a minimum brake application to restore the slipping pair of wheels to normal wheel-rail speed and then quickly releases.

When a locomotive axle slips, it accelerates to a high speed because it is then operating under less load than the axles which are not slipping. With pneumatic wheel-slip control, the brake is applied equally to all axles, taking maximum power from the slipping axle and minimum power from the others. This has little effect on engine output; when the slip is corrected and brake released, the locomotive is delivering full power. Locomotive speed is not materially affected. Only a light application is needed because the inertia forces involved are small. Such an application also reconditions wheel treads, improving adhesion.

The brake is applied in less than one-half second and, when the slip has been corrected and the speed of the slipping wheels returns to normal wheel-rail speed, the brake application is released in less than a second.

Experience has shown that it is preferable to make the brake application on all axles of a unit even though only one axle is slipping. For such an installation, only one control valve is required per unit, the most economical arrangement possible. When one axle starts to slip, the power it loses is transferred to the other non-slipping axles, thus increasing their tractive ef-



Full-scale railroad diesel engine tests lubricants in Shell's Martinez laboratory. Talona RS Oil 40 passed rugged 1000-hour test in this engine, was then released by Shell Research for intensive field trials.

BULLETIN:

Railroads report that diesel locomotives using Shell's Talona RS Oil 40 can run for more than 250,000 miles without an oil change

Diesel locomotives used to require an oil drain every 30,000 to 50,000 miles. Now, even locomotives in heavy-duty freight service are rolling 250,000 miles—and more—without an oil change. The reason: Shell's Talona® RS Oil 40. Read how this new lubricating oil can trim operating costs for you.

UNDER normal railway operating conditions, Shell's new Talona RS Oil 40 can be used from overhaul to overhaul without draining.

And with Talona RS Oil 40, railroads are finding that they can extend intervals between engine overhauls. Often, by substantial margins.

Five key reasons

Here are some of the key reasons for the outstanding performance records that this new diesel lubricant is making:

1. Talona RS Oil 40 contains special additives to resist oil oxidation. This allows the oil to lubricate effectively, without excessive thickening, even in prolonged heavy-duty freight service.

2. Talona RS Oil 40 has good detergent-dispersant qualities. It helps keep engines exceptionally clean.

3. Talona RS Oil 40 contains alkaline additives to help neutralize damaging acids—a major cause of engine wear in diesel locomotives.

4. Talona RS Oil 40 provides outstanding protection for silver bearing surfaces.

5. Talona RS Oil 40 has excellent filterability—a must for locomotive diesel oils.

NOTE: *All U. S. railroad diesel engine manufacturers have endorsed Shell Talona RS Oil 40 for use in their equipment.*

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SHELL

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fort and their tendency to slip. The application of the brakes to all the wheels tends to prevent the slipping of axles on which the tractive effort is increased, in addition to reducing the speed of the slipping axle.

The valve, designated as the wheel-slip controller, consists of a magnet valve portion and an adjustable limiting valve portion mounted on a common pipe bracket. The assembly is 9-1/16 in. long and 6-1/16 in. high. The basic application consists of one wheel-slip controller, one double check valve, and two J-1 relay valves. When wheel creep or slip is detected by the locomotive's slip sensing equipment, the magnet valve coil is energized, allowing main reservoir air to flow quickly through the adjustable limiting valve portion to the double check valve and then to the control pipe of the J-1 relay valve.

Because there are several different wheel-slip detection systems, wiring has to be tailored to the particular locomotive model on which an installation is made.

The adjustable limiting valve portion, set at about 15 psi, gives the fastest possible application by allowing control pressure for the relay valve to overshoot momentarily, fading quickly to the setting of the adjustable limiting valve. A surge of main reservoir air, corresponding to the control pressure, enters the brake cylinders to push the brake shoes against the wheels, overcoming inertia of the brake rigging. Calibration of the adjustable limiting valve portion cuts the surge of main reservoir air at approximately the instant brake shoes contact the wheel treads. Pressure then levels off and is controlled at the predetermined value. The brake system on each truck is fitted with a separate relay valve. One relay valve operates as a "slave" to the other. The first is actuated by control pressure from the wheel-slip controller, and the second is actuated by the main reservoir pressure from the first relay valve which is also transmitting air to the brake cylinders on the first truck.

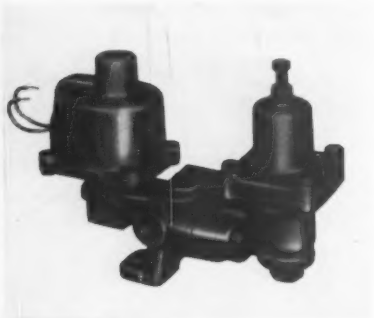
If a regular brake application is made while a wheel-slip controller application is in effect, and exceeds setting of adjustable limiting valve, shuttle valve in the double check valve will change position so the conventional air-brake system functions. When slipping stops, the detection system functions to de-energize the coil of the magnet valve, permitting air in the relay valve control pipe to exhaust rapidly through the open magnet valve portion. This causes a similar rapid exhaust of brake cylinder air through both relay valves.

On locomotives equipped with dynamic braking, circuits are arranged so the wheel slip controller is cut out when the unit is in dynamic braking.

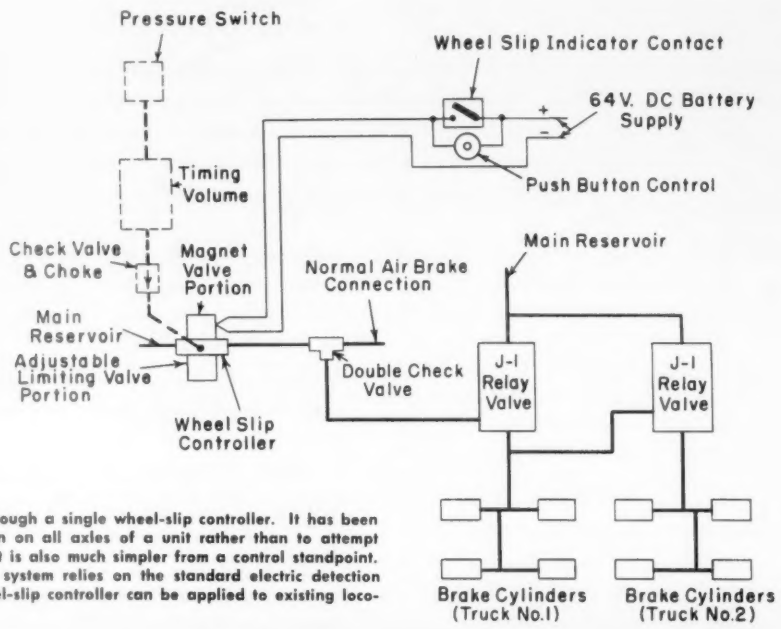
A pneumatic timing arrangement is used to initiate additional control actions when the slipping persists. A prompt brake application in response to a wheel slip signal will generally correct a wheel slip immediately and another wheel slip does not occur until another slippery spot on the rail is encountered. Long sections of bad rail may produce cycling of the pneumatic wheel-slip control. The timing circuit can be used to apply sand or reduce power to the traction motors when this cycling extends beyond a reasonable time. This additional equipment consists of a check valve, choke, timing reservoir, and pressure switch.

The pneumatic timing system on General Electric U25B locomotives, which were not tested on the GN, has the timing volume discharging continually through a small choke to atmosphere, building up a pressure to operate the pressure switch only if slip continues for three seconds. When slipping occurs, the wheel-slip controller is energized and excitation is slowly reduced simultaneously. If slipping continues for three seconds, sanding is initiated and the wheel-slip light and buzzer signal the operator that one unit is slipping. When the wheel slipping stops, sanding continues briefly after the brake application is released.

The NYAB pneumatic timing system on the GN's EMD units consists of a 40 psi spring loaded check valve and choke feeding the timing volume and pressure switch. The choke is calibrated to allow the timing reservoir pressure to build up to 60 psi if wheel slip continues for five seconds. When



Wheel slip controller is three-unit assembly consisting of a mounting bracket portion, an adjustable limiting valve portion, and a magnet valve portion. Overall length is 9-1/16 in. and the height is 5⅝ in.



All the brake cylinders on a unit are supplied through a single wheel-slip controller. It has been found most effective to make a brake application on all axles of a unit rather than to attempt to brake only the slipping axle. The arrangement is also much simpler from a control standpoint. For indications of slipping axles, the pneumatic system relies on the standard electric detection equipment. Great Northern has shown that wheel-slip controller can be applied to existing locomotives without complication.



12 winters have never iced this window

Photo courtesy New York Central Railway

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wheel slip occurs, the wheel-slip controller is energized on the slipping unit, the wheel-slip light is actuated on all units and sanding is applied on all units for 10 seconds. If wheel slip continues for five seconds or intermittent slips occur frequently enough to build up the timing volume to 60 psi, the pressure switch opens, dropping the shunt field relay to open the shunt and battery field contractors and remove excitation from the main generator. When the shunt field relay opens, the wheel-slip controller is also de-energized, releasing the brake application. Pressure in the timing volume drops, allowing the pressure switch to close and picking up the shunt field relay so that the main generator is again excited. The entire cycle takes less than ten seconds.

The timing arrangement just described is the one applied to the three Great Northern GP-20 road locotives which have been used for testing. The wheel-slip controller on these units can be energized by the operation of any combination of the WCR, WS, WS13, or WS24 wheel-slip relays. In almost all cases, at least two of these detected the slip. Operation of the wheel-slip controllers was recorded during the tests by stroke counters installed on the locomotives. Other instrumentation showed operation of the four wheel-slip relays on each unit, operation of sanders, and indication of whether unit was in series or parallel transition.

Using the three locomotives, a 1,900-mile test run was made from Minncapolis, Minn., to Hillyard, just outside Spokane, Wash., and back to Havre, Mont. The three test units were coupled together and used as the lead units on several different trains. During this test a total of 285 wheel slips occurred—173 on the lead unit, 67 on the second unit, and 45 on the third unit. Wheel slips were corrected quickly in one to two seconds from the time of indication. During grade operation when frequent wheel slip actions were corrected, by the wheel-slip controller and automatic sanding, train speeds remained constant and tractive effort was continuous. Wheel slips corrected on one locomotive unit did not induce wheel slips on other units, as is the case with the standard wheel-slip correction where power is removed and reapplied.

"Under good rail conditions and maximum load, speeds of 17 mph. or lower, are within the range where slips are most likely to occur," the GN reported. "Automatic sanding is necessary for optimum results with wheel-slip correction systems. This was proved during the test by the cutting in and out of automatic sanding . . . Additional brake shoe wear from pneumatic wheel-slip control was found to be negligible."

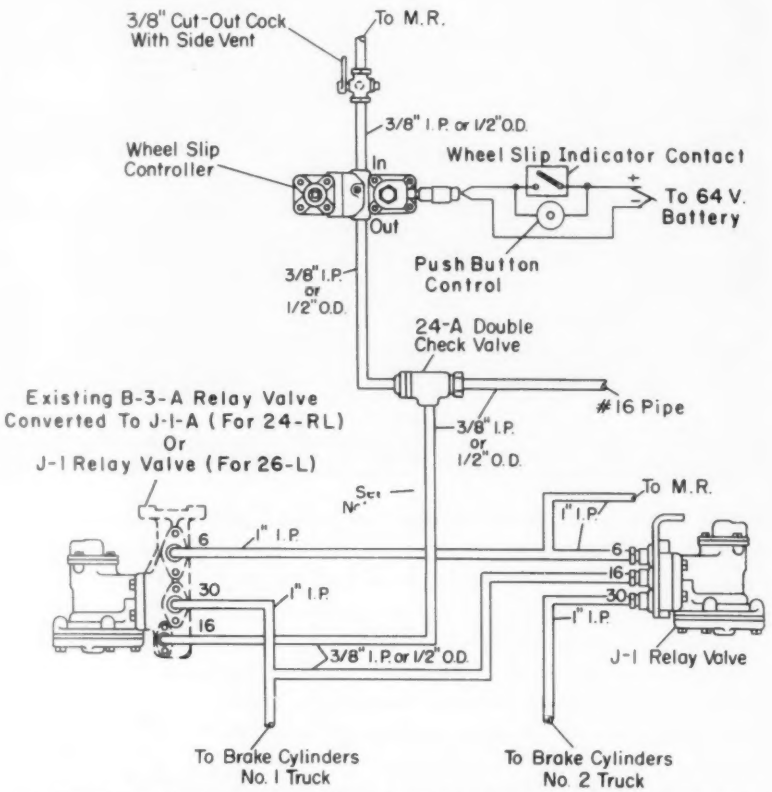
The original GN installation had been made four months earlier on one of these three units used in the multiple-unit test run. Observations were made on a 1,400-mile trip from Minneapolis to Hillyard with this locomotive used as the lead unit of a multiple-unit locomotive consist. Wheel slips were effectively corrected in 95% of the cases with automatic brake and sanding applications.

"With the exception of rail conditions between New Rockford [N.D.] and Minot [N.D.], Minot and Des Lacs [N.D.], and on passing tracks, rail conditions were good," it was reported. "During this single-unit test a total of 151 wheel-slip actions were noted on the unit with the wheel-slip controller. Corrections were made very quickly—in approximately one to two seconds in all but seven cases.

These seven wheel-slip actions were over five seconds' duration, and occurred at speeds of 35 to 60 mph. The removal and reapplication of excitation to the main generator was smooth and fast. The total time from the wheel-slip indication to reapplication of excitation was approximately ten seconds.

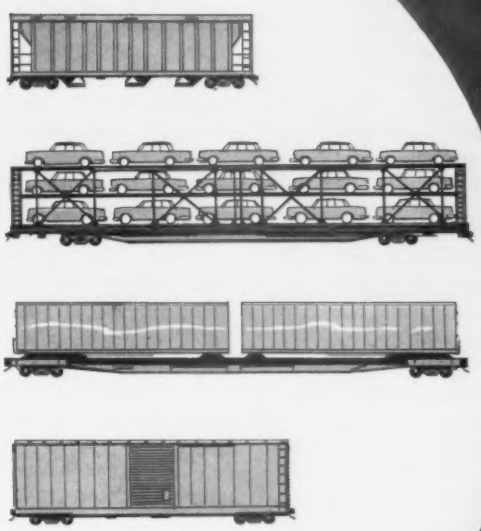
"In ascending a 13-mile grade on frosty rail, a total of 68 wheel-slip actions occurred which were quickly corrected. Power or excitation was never reduced either automatically or manually on this grade.

"Even under dry, good rail conditions, wheel slip occurred frequently on trailing units, particularly on relatively level track in the 40- to 60-mph speed range . . . From Havre to Hillyard, the unit with the wheel-slip controller experienced 23 automatic brake and sanding applications, while 73 automatic sanding operations and excitation removals occurred on the three trailing units."



Typical installation shows application of wheel slip control to locomotive with 24-RL brake including B-3-A relay valve, or with 26-L brake without F-1 selector valve. Broken lines indicate existing components. Pipe from controller to J-1 valve is not to be longer than 15 ft; the J-1 valves are to be as close as possible to the trucks they control.

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automatic double-acting brake slack regulators

The proven performance of SAB Brake Slack Regulators makes for correct, automatic brake adjustments on these heavy-duty, high-mileage cars. SAB Brake Slack Regulators provide the much desired safety and dependable brake service that eliminates terminal delays and cuts maintenance costs to a minimum. Their excellent performance and durability record is evidenced by the continually growing number on cars of American railroads.

AAR APPROVED



SAB

AMERICAN SAB COMPANY, INC. 332 South Michigan Avenue, Chicago 4, Illinois

Doc Puts His Diesels on the Spot

By Gordon Taylor

There had been too many diesel failures; the mechanical department was greatly concerned. The preventive maintenance program did not seem very effective; something certainly had to be done to get maintenance back on the track. The diesel shop superintendent at Centerville called his supervisors together to discuss the problem. When the meeting opened, the superintendent said, "All of you know the purpose of this meeting. We are looking for ideas that will make our locomotive performance more dependable. Tell us exactly what you think is wrong and what should be done to correct it."

The first foreman spoke at length on the need for more men in the maintenance force. The next speaker said much the same in a roundabout way. He said maintainers needed more time for their work; that locomotives were called for service too soon.

"Our performance doesn't show up well when compared with our competitors, because they have newer model locomotives that don't require as much maintenance as ours," the third speaker began. "We should replace some of the older units."

"We're getting nowhere," the shop superintendent broke in. "I'm looking for someone to point the way to something we can do with what we have." Turning to Doc Watts, the electrical foreman, he asked, "What's on your mind, Doc?"

"What the last speaker said about the advantages of new locomotives gives me a springboard from which to jump into what I'm about to say," Doc replied. "The new units are much improved because the builders, learning from experience, have improved those parts causing trouble, or have eliminated them entirely.

"I'm wondering if railroads have benefitted as much as the builders from experience. If so, our experience should be pointing the way to better maintenance methods. We must be sure that everything we do needs doing, and that it gets done in the most efficient way.

"One of our most time-consuming operations is cleaning of parts and locomotives. It may be that new cleaning materials, or completely new methods should be given careful study. I believe that much of the time and labor spent in cleaning could be better spent in inspection and repairs. Here would be one way to get the extra help discussed earlier.

"Our past experience shows it's very difficult for supervisors to have a clear picture of the progress being made day by day in our preventive maintenance program. To a certain degree our diesels have us on the spot. I propose that we put our diesels on the 'spot.'

"This is an idea borrowed from the builders, and several roads are already using it," Doc continued. "Builders would get nowhere in assembling their locomotives if they tried to do all of the work in one place. Men would be in each other's way and much time would be lost as they interfered with one another.

"Several roads have set up 'spot' repair facilities for diesel maintenance and, from what I've learned, they are proving quite successful.

"The first step taken by most roads in establishing spot systems is to make detailed studies of their preventive maintenance schedules to see how the work can be divided into spot jobs—jobs that could be performed at one location with a minimum interference between men working at different tasks.

"It is necessary to plan these spot jobs so they can each be completed in the same length of time. All units on a line must be advanced to the next spot simultaneously. I know one road which aimed to complete each spot job ine one hour. When their study was complete, it was found that the number of units to be handled and the number of 'spots' which could be established would allow 70 min at each location, including the time for moving the line."

At this point one of the foremen spoke up and said, "How on earth do you move these units? They have to be shut down while work is being performed on them, don't they?"

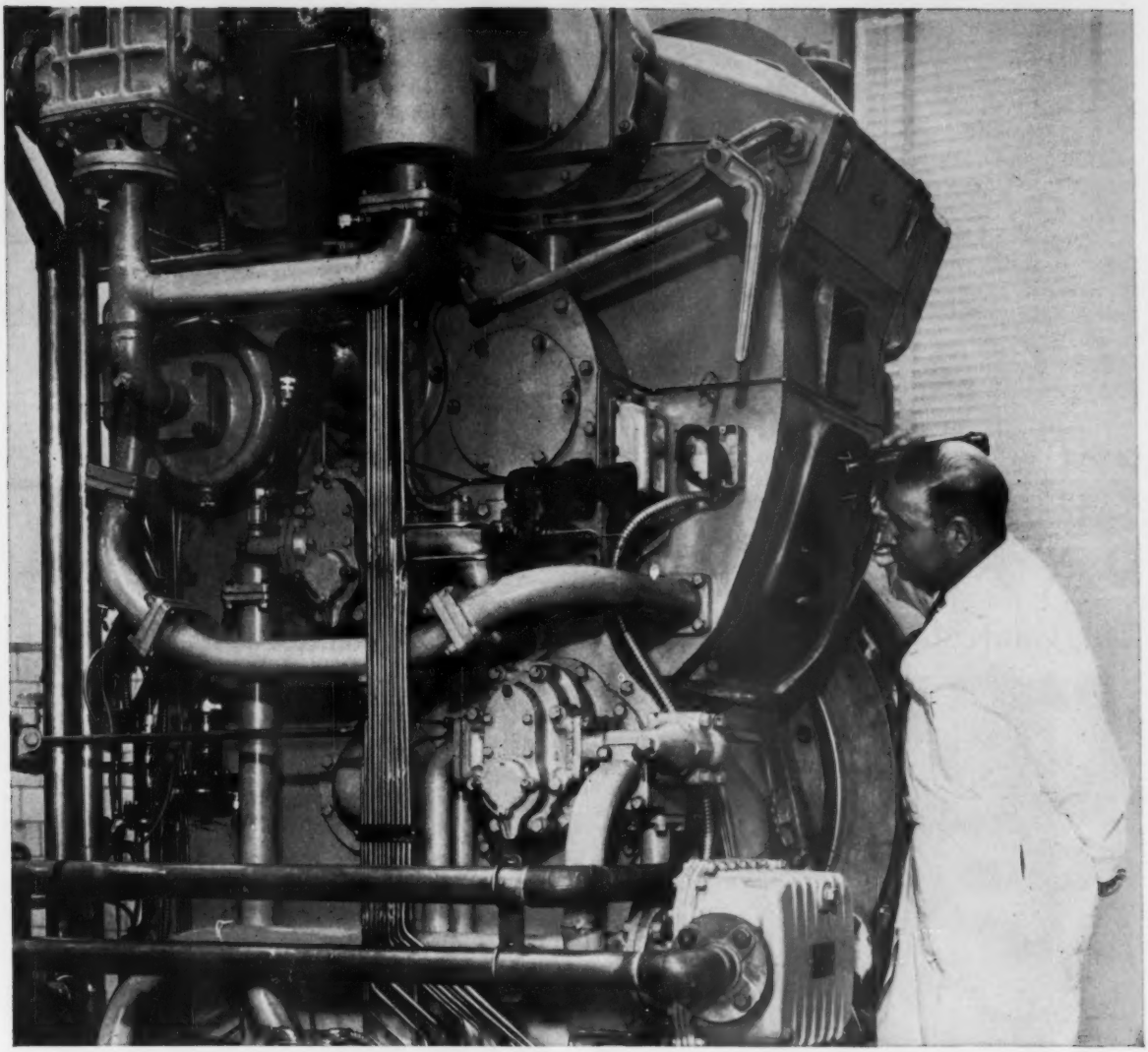
"It hasn't been too complicated," Doc replied. "All the moving along the line can be done by the unit coming into the No. 1 position. Before getting its inbound inspection, it can move into the shop under its own power, advancing all units from one work station to the next. The units are separated after being properly spotted, and the unit which does this can be returned to the No. 1 station where it is given a preliminary inspection before the engine is shut down. Another method is to power a traction motor on one unit from the battery on that unit. This unit can then move the line.

"The important thing about this spot program is that all units must be ready to be advanced at the same time. If something interferes with the program of the line of units through the shop, it is at once apparent and the lack of men or materials becomes a matter of first importance to supervisors. This plan automatically establishes production quotas for the maintenance forces. When you adopt this spot system for performing ICC inspections and preventive maintenance, it's much like taking a daily pledge to do promptly everything necessary to fill the requirements of the preventive maintenance program. It certainly doesn't encourage slipshod work either. Each man signs the work slips, acceptaing responsibility for the jobs assigned to him.

"Material and tool racks must be provided at each work location to keep the materials and tools for the operations performed there. Most railroads have found it expedient to set up a work area where components removed on a routine or emergency basis can be cleaned, rebuilt, or repaired to make them ready for reuse. Such a work area can be staffed by a group which is assigned to work on the progressive line when a unit is found to require emergency repairs. They may also work on units due for semi-annual or annual ICC inspections."

(Continued on page 44)

This series of articles is based on actual experiences of men who operate and maintain diesel-electric locomotives.



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HUMBLE OIL & REFINING COMPANY



At this point one of the foremen spoke up. "It must require a rather large force of men to handle a series of spot repair stations. Doc, can you tell us about that?"

"You will probably be surprised," said Doc, "but one seven-station shop facility that I have read about has a regular force of 22 men to cover all stations. Seven units are processed through this line in 8 hr. Having the tools and materials needed at each spot location reduces non-productive time to a minimum.

"One chief mechanical officer recently described his spot maintenance system as 'the most significant advancement in the mechanical department since diselization.' A statement like that should be food for thought for all of us.

"Now, Doc continued, "this setting up of spot repair facilities is a big undertaking, but it pays off. We may not be able to establish a complete spot line immediately, but it gives us a goal. If spot or progressive line methods enable builders to build locomotives at the lowest cost, it would seem we should follow similar procedures in the maintenance of those units."

"In any case, I believe we should immediately investigate the possibility of improving our diesel cleaning procedures. Improved materials and new methods should produce worth while savings. Labor used in cleaning could better be spent on inspection and repair."

"Doc," said the superintendent, "you've given us much to think about. I'm glad you have passed on to us the ideas gleaned from your reading and study. Spot maintenance for our diesels may be just what is needed to take our diesel maintenance force off the spot."

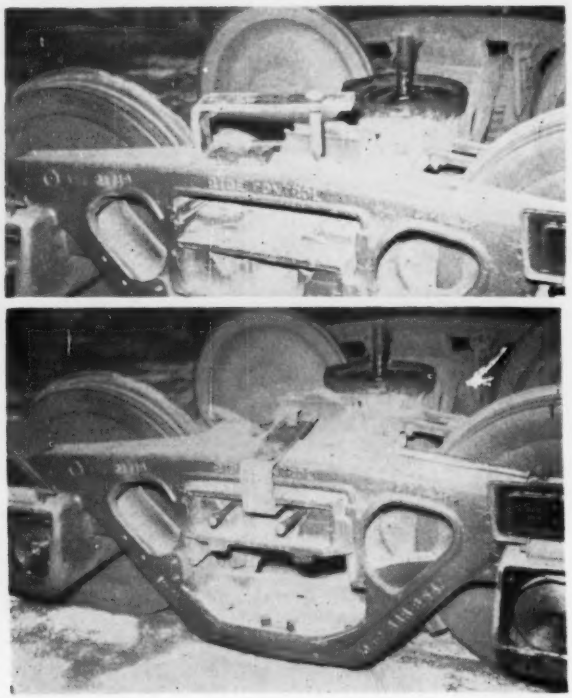
Car Repair Time Savers

Car Control



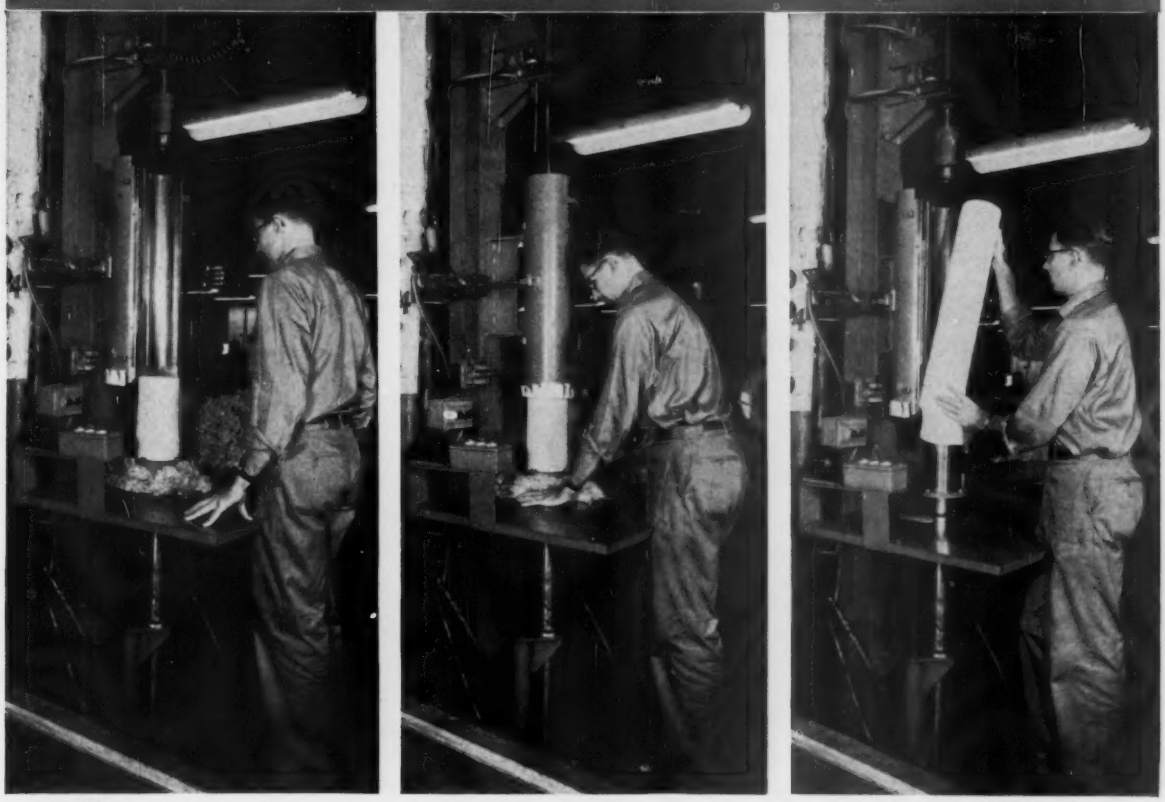
This control unit was developed at a car builder's plant for stopping cars at the air-test position on the shipping track. It makes it possible to walk alongside of cars rather than between them as they are being pulled or pushed, eliminating the possibility of injury when stepping between moving cars to separate hoses. The device consists of a ¾-in. hose with a car coupling on one end. The other end has a ½-in. fitting, a tee and valve. When coupled to the car and shop air applied at tee, the valve is opened and car can be stopped where desired.

Bolster Clamp



Bolster clamp, developed by the Duluth, Missabe & Iron Range, is used at the Proctor, Minn., car shop to hold side-frame truck bolster in place while changing springs or welding friction plates. The J-shaped clamp is made of ¾ - x 3½-in. steel bar, has a 17-in. top leg, a 6½-in. lower leg, and is 6 in. across. It weighs 20 lb. The clamp is fixed in position by a 1-in. diameter pin extending through top leg and down behind side frame. Use of the clamp makes a safer job and releases the shop's overhead crane for other operations.

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Keeping injector nozzles clean is one of the most difficult diesel engine maintenance problems. Carbon deposits and fuel oil varnishes cause the injector needle to stick tight . . . almost impossible to remove without damage to the needle.

Now the injector needle can be easily removed and both parts cleaned . . . if you **Lix it!** A few hours soaking in Lix Cleaner Number 401 removes all carbon varnish and grit deposits . . . leaves all surfaces as clean as new.

Without brushing or scraping, Lix soak-type cleaners **soak away** accumulated grime from pistons, liners, heads, injectors and lube-oil coolers, without damage to vital parts. All metals can be cleaned in the same tank, at the same time. Lix rinses away with water or mineral spirits and leaves no granular deposits—reduces after-rusting. Safe to use, Lix cleaners are low in toxicity and are not fire hazards.

Lix cleaners cost less to use than even the so-called "economy" cleaners. Lix lasts longer and requires less frequent charges.

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What's New

(Continued from page 9)

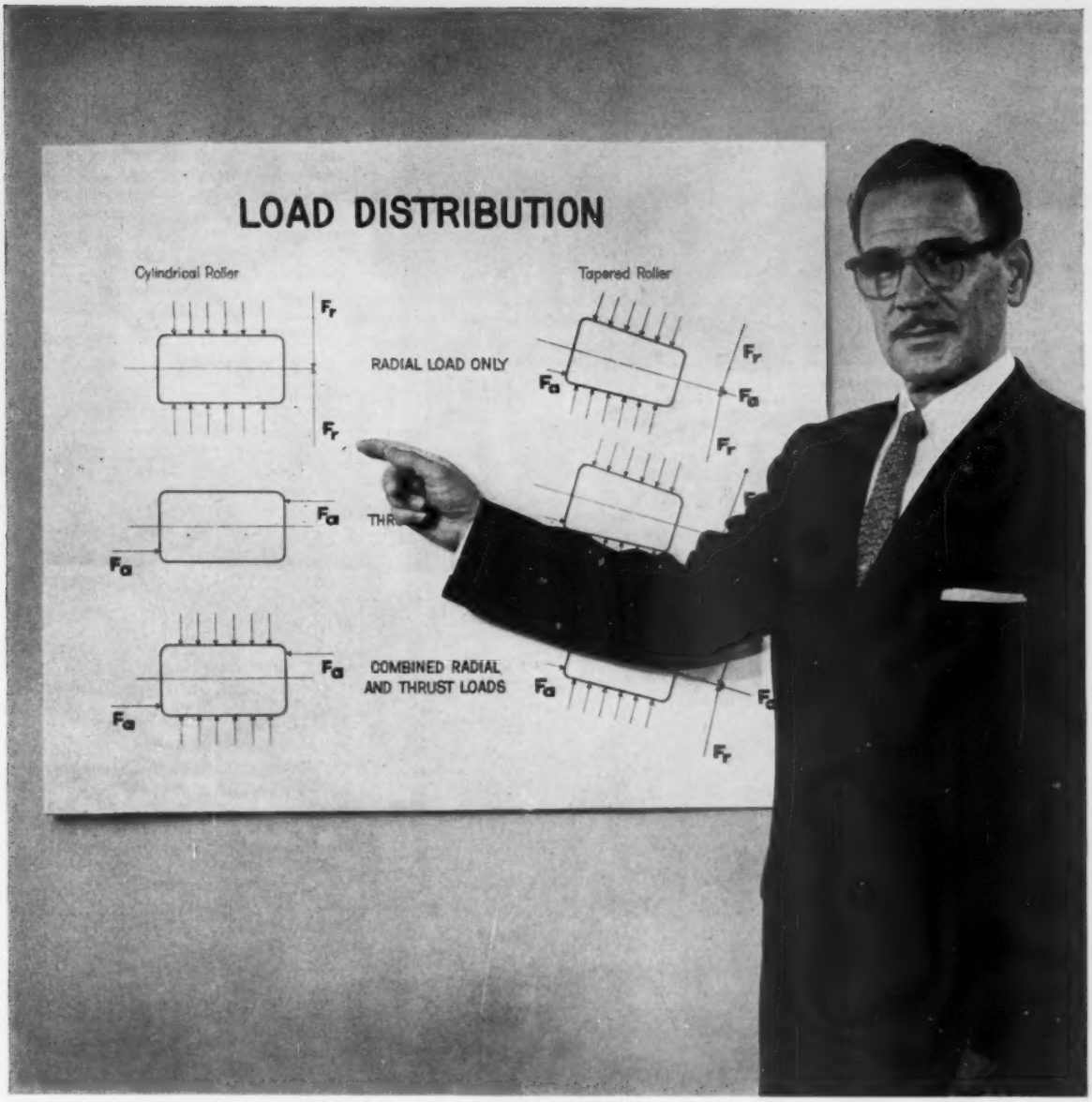


nozzles float freely as a plate riding wheel moves over the work surface, maintaining the proper nozzle-to-workpiece distance regardless of surface contours which could cause irregular cuts. When nearing the end of a cut, the free floating feature can be locked out so that torch nozzles will not drop onto the work as the wheel moves off the edge of the plate. To simplify nozzle cleaning, it can also be locked at a 45-to 90-deg angle. The unit can be mounted on a flame-planer type bridge, Linde CM-48 side-beam carriage, or the Linde CM-37 portable machine carriage. The PE-1 attachment is 45 in. high, including torches and nozzles; has a 20-in. wide base, and weighs approximately 111 lb. *Oxweld Railroad Dept., Linde Co., Division of Union Carbide Corp., Dept. RLC, 270 Park ave., New York 17.*



Lubrication Kit

The PM-506-8 lubrication kit includes pump, meter, and hose. The Prime-Alemite roller bearing lubricator features the Prime-PM-412 meter which provides a positive measure quantity of lubricant (in oz) to



George Goodloe, SKF® Railway Sales Engineer, tells . . .

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"Under radial load, the forces on a cylindrical roller directly oppose each other . . . with a tapered roller, radial load produces a thrust reaction that must be resisted at the roller head.

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"Size for size, material for material, workmanship for workmanship, it is an accepted engineering fact that the cylindrical roller offers greater capacities."

You can get more details on why cylindrical roller bearings are right for freight cars by calling the SKF Railway Sales Engineer in your area, or write: SKF Industries, Inc., Front Street and Erie Avenue, P. O. Box 6731, Philadelphia 32, Pa.

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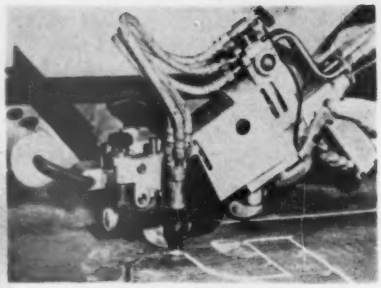
SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

journal boxes. Two meter models are available—the PM-412-4 calibrated from zero to 4 oz, and the PM-412-8 calibrated from zero to 8 oz. The meter can be pump mounted. *Prime Manufacturing Co., Dept. RLC, 1669 South First st., Milwaukee, Wis.*

Flame-Cutting Machine

Fast, clean cuts in metals ranging in thickness from light gage sheet to 2 in. thick, it is said, can be made with the CM-75 Cadet, a 19-lb flame cutting machine. A clutch allows instantaneous free-wheeling control, making the machine suitable for hand-guided contour cutting. Straight-line cutting, bevel cutting, circle cutting, and some contour cutting can also be handled. The

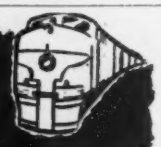


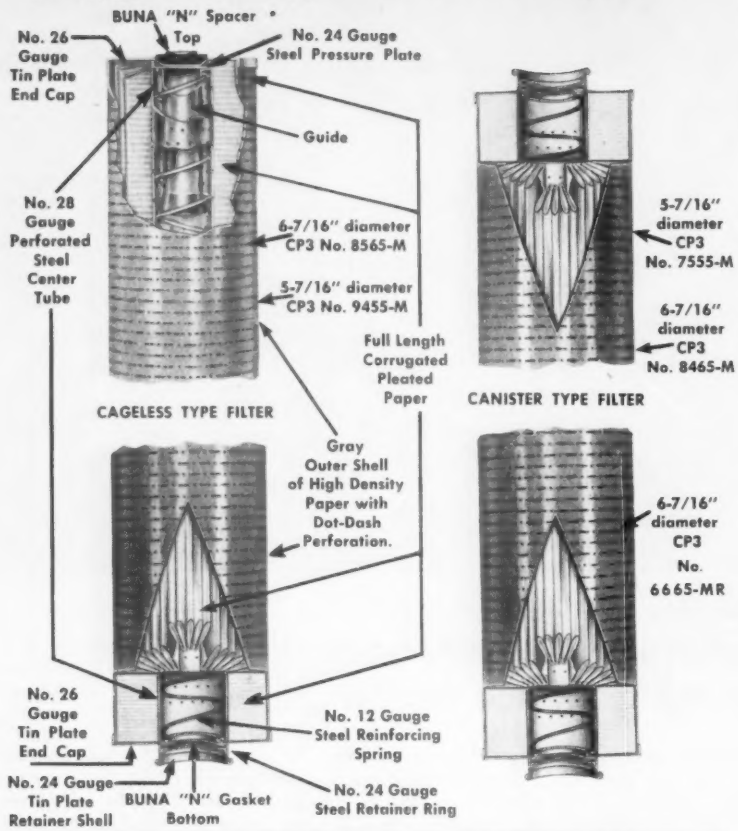
machine operates at speeds up to 30 ipm and can be used with acetylene, propane, or natural gas. *Linde Co., Division of Union Carbide Corp., 270 Park ave., New York 17.*

Protective Coating

After 14 months in service hauling coal for the Berwind-White Coal Mining Co., a hopper car coated with Lipoxy, a compound containing a Thiokol LP liquid polymer, was said to be in good condition, with an estimated 97% of the coating in perfect condition. The compound, formulated by the Cosden Paint Co., is applied by spray or brush and cures at room or elevated temperatures. It is dry to the touch in 1 hr; can be handled in 90 min, and overcoated in 1½ to 3 hr. *Thiokol Chemical Corp., Dept. RLC, Trenton, N. J.*

SUPERIOR DIESEL FILTER CO.





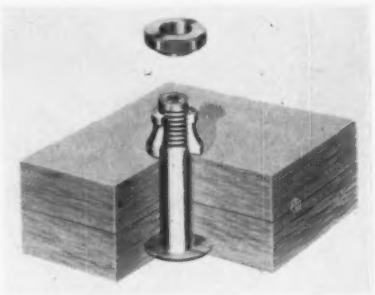
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Heat Generator

A direct-fired heat generator complements the Herman Nelson De Luxe and Utility portable heaters. It was developed for sites where quick space heating and volume air circulation is a necessity, and is available in two sizes with Btu output ranging from 125,000 to 300,000. *American Air Filter Co., Dept. RLC, Louisville 8, Ky.*



Threaded Fastener

The Hi-Lok is described as a threaded fastener which combines the best advantages of a nut and bolt with those of a rivet. It includes a threaded pin and a self-locking, threaded collar with its torque-off wrenching device. When the assembly of the collar and pin is completed, the wrenching device is automatically torqued off at the predetermined design load consistent within plus or minus 10%, regardless of fastener size. The device can be installed in tight clearance areas, as well as open areas, because of the 90-deg tooling approach to the fastener during assembly. *Hi-Shear Corp., Dept. RLC, Torrance, Calif.*

Nylon Air Hose

A compression elbow fitting and a special "non-slip" aluminum ferrule are supplied with Nycoil, a nylon air hose that stretches and recoils like a telephone cord. Air flow is unobstructed. The hose can be connected to any straight or pistol-type air tool, or to equipment requiring air pressure up to 200 psi. It is available in standard 25 ft lenghts with positive-lock full flow fittings on each end. *Nycoil Co., Dept. RLC, Westfield 4, N. J.*

Supply Trade Notes

RUSSELL, BURDSALL & WARD BOLT & NUT CO.—The *Fastening Service Center of Kansas City, Inc.*, an RB&W subsidiary, has been opened in Kansas City where major U.S. brands of industrial fasteners—ESNA elastic stop nuts and roll pins, Pop Rivets from United Shoe Machinery, MacLean-Fogg lock nuts, etc., as well as the complete RB&W line—will be available.

■

WYANDOTTE CHEMICALS OF CANADA LTD., J. B. FORD DIVISION.—*Terence Neill*, Wyandotte's Canadian sales manager, elected a director and named director of sales of this Wyandotte subsidiary. New plant at 41 Metropolitan Road, Scarborough, Ont., has facilities for manufacturing all types of products, both dry and liquid, and laboratory facilities for testing all raw materials and finished products.

■

EVERSON ELECTRIC CO. — *John S. Askey* appointed engineering manager of Everson Electric of Allentown, Pa.

■

GOODYEAR TIRE & RUBBER CO.—Contracts completed with *Moon Welding & Machine Corp.*, Kokomo, Ind.; *Chemical Proof Corp.*, Seattle, Wash., and *Standard Rubber Co.*, San Francisco and San Jose, Calif., for application and repair work on Plioweld and Trioweld lining materials for tank cars.

■

KEYSTONE RAILWAY EQUIPMENT CO.—*Fred M. Groff* appointed sales manager. Mr. Groff formerly eastern district sales manager, Stran Steel Corp.

■

RAILWAY MAINTENANCE CORP.—*Richard E. Franklin* elected vice-president in charge of manufacturing, engineering, and spot car repair systems.

■

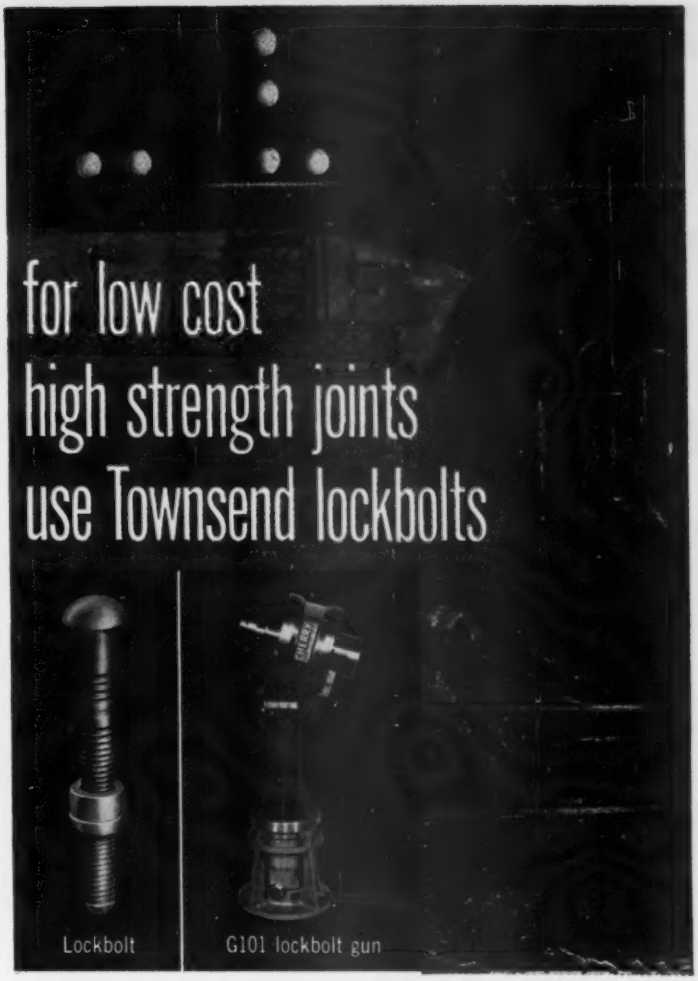
WESTINGHOUSE AIR BRAKE CO.—*W. C. Landis*, vice-president and general manager, Air Brake Division, retired.

■

ARTNELL CO.—Artnell of Chicago has purchased *National Seating Co.* of Mansfield, Ohio, manufacturer of transportation seating. *R. G. Brooks*, president of National Seating, and *Dan Cross*, vice president-sales, continue in those capacities.

■

AMERICAN STEEL FOUNDRIES. — ASF plans to change its corporate name to *Amsted Industries, Inc.* Change subject to stockholders' approval at January 23 annual meeting. To preserve the "substantial com-



New car builders and repair shops get uniform, vibration-proof, secure joints at low installed cost with Townsend lockbolts.*

Townsend lockbolts are easy to install with a 2 or 3 man crew. Ordinary type fasteners require larger, more costly, highly specialized crews. Increased driving speed and the elimination of fitting-up operations step-up production. Worker fatigue is minimized.

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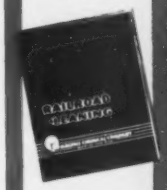
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This 45 page handbook is a manual of modern railroad cleaning methods. Covers everything from dining car dish washing to diesel engine block overhauling.

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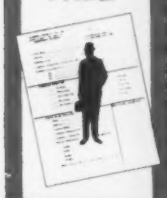
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mercial value" of the 60-year-old ASF name, the Transportation Equipment and Hammond Division to be operated as American Steel Foundries, Inc.

■

AMERICAN BRAKE SHOE CO.—Railroad Products Division plans to spend $2,500,000 to convert its Toledo, Ohio, cast-iron freight-car-wheel foundry to the production of its "Southern" cast-steel wheel. Plant, when completed late in 1962, to be capable of producing 45,000 wheels annually.

■

ADAMS & WESTLAKE CO.—Adlake has purchased the *Loeffelholz Co.*, Milwaukee, Wis. *Nicholas J. Nowicki* of Loeffelholz engineering and sales staff, has been retained by Adlake's Transportation Division and will operate from Chicago sales office.

■

LEWIS BOLT & NUT CO.—*Modern Supply Co.*, 222 West Adams st., Chicago 6; *Robert E. Mann*, and *Earle A. Mann* appointed manufacturers representatives.

■

OAKITE PRODUCTS, INC.—*Donald F. Moulton* appointed technical service representative in Vermont.

■

YOUNGSTOWN STEEL CAR CORP.—Operations of Youngstown Steel Car have ceased.

■

SCULLIN STEEL CO.—*William J. Ennis* appointed district sales manager, Chicago area.

■

ELECTRIC STORAGE BATTERY CO., EXIDE INDUSTRIAL MARKETING DIVISION.—*Charles A. Taylor*, manager, Washington district, appointed manager, southeast region, Washington, D.C., succeeding *J. A. Klingensmith*, retired.

■

AEROQUIP CORP.—*O. L. Adkins* appointed products manager, railroad sales, Jackson, Mich.

■

UNION TANK CAR CO.—Offices formerly at 228 N. LaSalle, Chicago, now in Union Tank Car Building, 111 West Jackson Blvd., Chicago 4.

■

COLORADO FUEL & IRON CORP.—*Leonard C. Ross*, executive vice-president, elected president and director, succeeding *Alwin F. Franz*, now chairman of the board. *W. W. Leonard* appointed manager, tubular sales, Western division. *D. W. Kelly* named assistant to manager, tubular sales.

■

VAPOR CORP.—Vapor has acquired business and assets of the *Transit Division of National Pneumatic Co., Inc.* Company will become National Pneumatic Division of Vapor Corporation.

■

HENSCHEL-WERKE.—*Henschel-Werke*, Gm.b.H. of Kassel, West Germany, entering American market with a 4,000-hp diesel hydraulic locomotive. Company to be converted into a publicly held corporation on January 1, 1962, with a group of U.S. investors holding 44% of capital stock.

OBITUARY

ELMER C. WRAUSMANN, vice-president-sales, St. Louis Car Co., died November 8.

Freight and Passenger Car Charts

These charts are very helpful to AAR billing clerks, mechanical engineers, purchasing and stores personnel, car inspectors, write-up men, car foremen, and anyone else who needs a knowledge of car parts and their relation to each other.

The charts include a cutaway diagram of the car and a listing of important parts with arrows showing where the part is located. These charts are a part of standard training programs used on a number of major railroads.

$2 each
$10 for any six

If you are not satisfied
YOUR MONEY WILL BE REFUNDED
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Please send the charts I have checked below. If I am not satisfied I will return the charts within 30 days for a full refund. I enclose a check or money order for $2.00 for each chart or $10.00 for any six charts.

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☐ Covered hopper car (22x30 inches)
☐ Box car, AAR standard 40 ft. (23x25 inches)
☐ Air conditioned chair car, 1930 design (18x35 inches)
☐ Tank Car (22x35 inches)
☐ Refrigerator Car, wood sheathed, steel underframe, 1920 design (14x20 inches)

12/61

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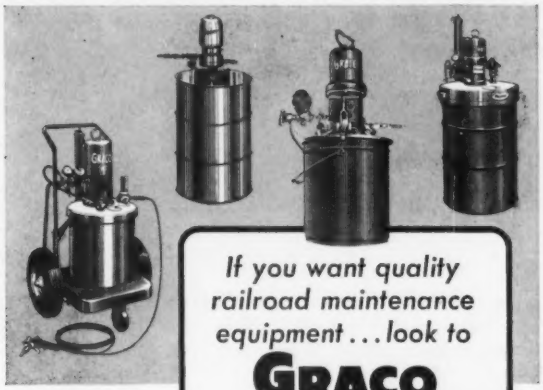
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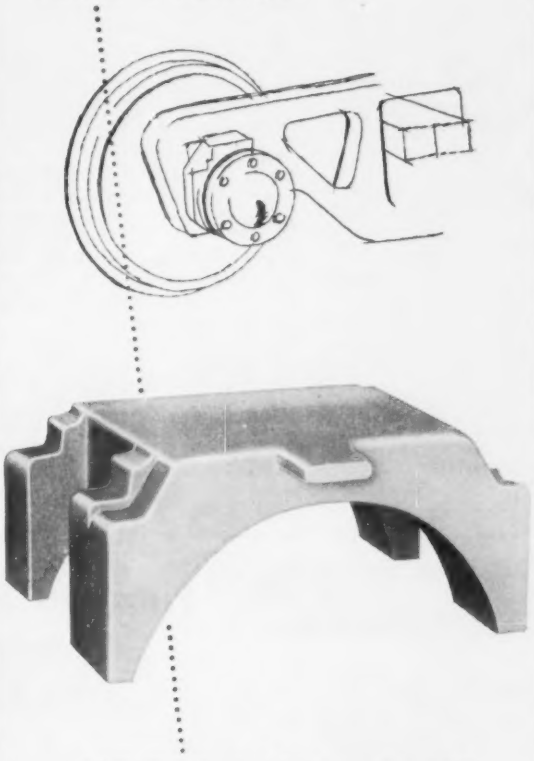
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CORROSION RESISTANCE OF STEELS. 60-page booklet, describes "The Role of Molybdenum and Copper in Corrosion Resistant Steels and Alloys." (Write: *Climax Molybdenum Co., a division of American Metal Climax, Inc.,* Dept. RLC, 1270 Avenue of the Americas, New York 20.)

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WELDING WIRES AND RODS. Catalog F-1486 describes various Oxweld electric welding wires and rods for all continuously fed electrode welding processes. Details recommended welding processes and Oxweld wires and rods to meet various AISI, AMS, ASME, and AWS (ASTM), specifications for electric welding of aluminum; copper; aluminum-, phosphor- and silicon-bronze; carbon steel; stainless and alloy steels. (Write: *Linde Co.,* Dept. RLC, 270 Park ave., New York 17.)

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INNERSHIELD WELDING. Bulletin No. 5300.1 describes vapor-shielded arc welding and new semi-automatic Innershield Squirt and full automatic Innershield welders. Illustrates typical applications and compares performance characteristics and process speeds with manual shielded metal arc and semi and full automatic submerged arc welding. (Write: *Lincoln Electric Co.,* Dept. RLC, Cleveland 17, Ohio.)

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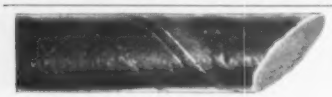
TRUCK SPRING TESTING MACHINE. Bulletin AD-124 details advantages of new truck spring testing machine developed by the spring industry and the AAR Condemning Limit Program. (Write: *Duff-Norton Co.,* Dept. RLC, Four Gateway Center, Pittsburgh 22, Pa.)

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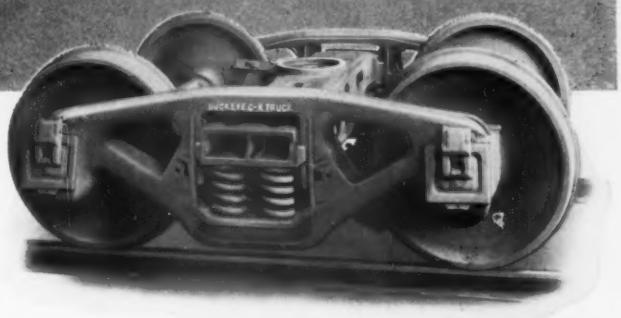
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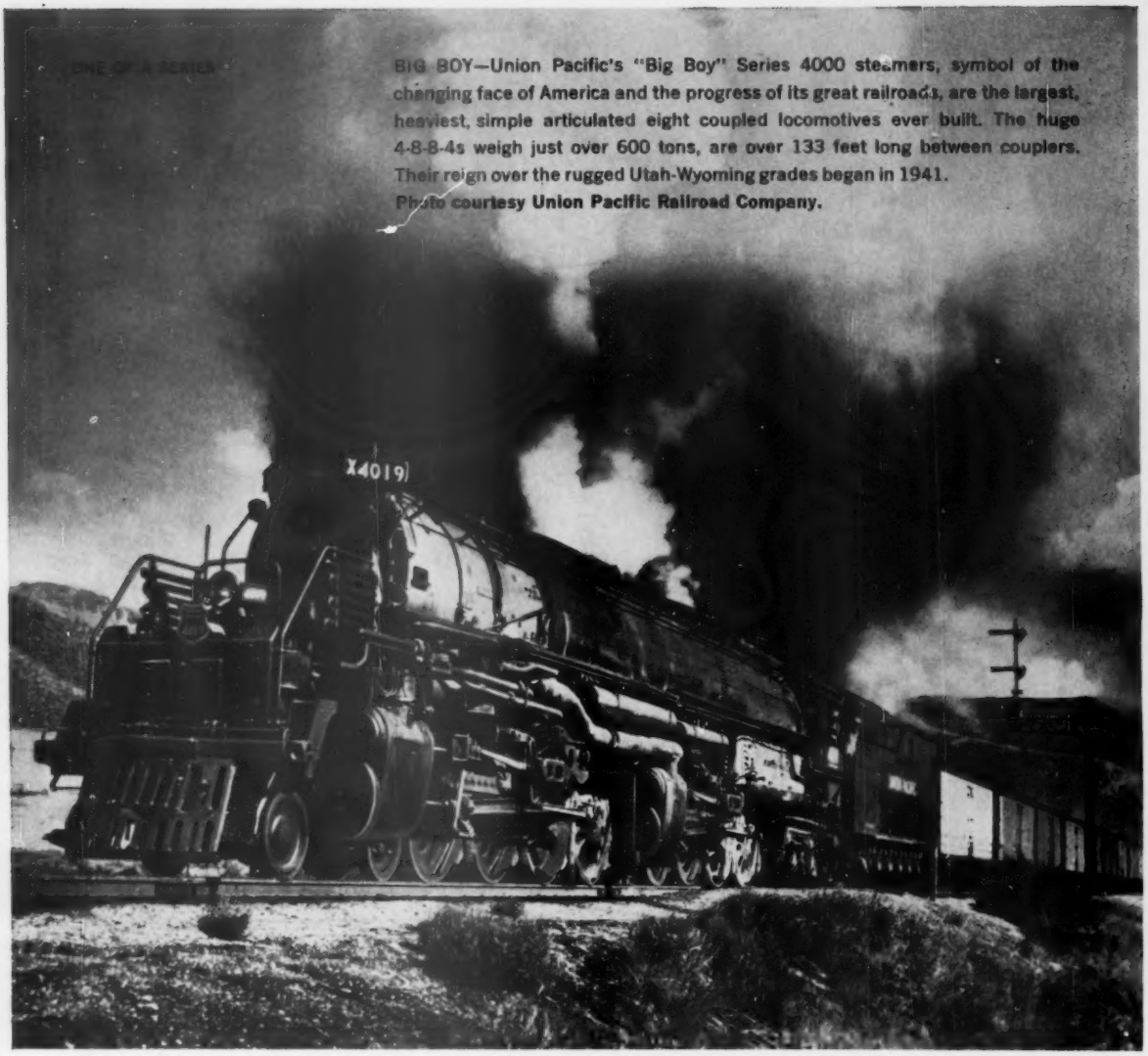
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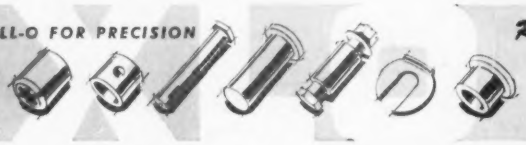
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